token estate

Real Estate Tokens Marketplace

Whitepaper

Published October 2017

V1.9 updated October 25th, 2018

For public release

LEGAL DISCLAIMER

POTENTIAL INVESTORS SHOULD NOTE THAT PARTICIPATION IN THE TOKENESTATE SA FUNDING ROUNDS IS SUBJECT TO LIMITATIONS IMPOSED BY APPLICABLE SECURITIES LAWS IN VARIOUS JURISDICTIONS.

THE FOLLOWING DOES NEITHER CONSTITUTE AN OFFER TO BUY OR TO SUBSCRIBE FOR SHARES OR FOR THE TEM TOKEN OF TOKENESTATE SA NOR A PROSPECTUS WITHIN THE MEANING OF APPLICABLE SWISS LAW (I.E. ART. 652A OF THE SWISS CODE OF OBLIGATIONS).

INVESTORS SHOULD MAKE THEIR DECISION TO BUY OR TO SUBSCRIBE TO TEM TOKENS OF TOKENESTATE SA SOLELY BASED ON THE OFFICIAL PROSPECTUS WHICH WILL BE PUBLISHED BY TOKENESTATE SA AND WILL BE AVAILABLE FREE OF CHARGE AT TOKENESTATE SA, RUE DE LA PLACE D'ARMES 3, CH-2000 NEUCHÂTEL, SWITZERLAND.

THE INFORMATION CONTAINED HEREIN SHALL NOT CONSTITUTE AN OFFER TO SELL OR THE SOLICITATION OF AN OFFER TO BUY, IN ANY JURISDICTION IN WHICH SUCH OFFER OR SOLICITATION WOULD BE UNLAWFUL PRIOR TO REGISTRATION, EXEMPTION FROM REGISTRATION OR QUALIFICATION UNDER THE SECURITIES LAWS OF ANY JURISDICTION.

TOKENESTATE SA SHARES OR TEM TOKENS ARE NOT FOR SALE AND DISTRIBUTION, DIRECTLY OR INDIRECTLY, IN OR INTO ANY GEOGRAPHY OR ANY JURISDICTION INTO WHICH THE SAME WOULD BE UNLAWFUL.

INVESTORS ARE FURTHERMORE ADVISED TO CONSULT THEIR BANK OR FINANCIAL ADVISER BEFORE MAKING ANY INVESTMENT DECISION. THIS PUBLICATION MAY CONTAIN SPECIFIC FORWARD-LOOKING STATEMENTS, E.G. STATEMENTS INCLUDING TERMS LIKE "BELIEVE", ASSUME", "EXPECT", "FORECAST", "PROJECT", "MAY", "COULD", "MIGHT", "WILL" OR SIMILAR EXPRESSIONS. SUCH FORWARD-LOOKING STATEMENTS ARE SUBJECT TO KNOWN AND UNKNOWN RISKS, UNCERTAINTIES AND OTHER FACTORS WHICH MAY RESULT IN A SUBSTANTIAL DIVERGENCE BETWEEN THE ACTUAL RESULTS, FINANCIAL SITUATION, DEVELOPMENT OR PERFORMANCE OF THE COMPANY AND THOSE EXPLICITLY OR IMPLICITLY PRESUMED IN THESE STATEMENTS.

AGAINST THE BACKGROUND OF THESE UNCERTAINTIES, READERS SHOULD NOT RELY ON FORWARD-LOOKING STATEMENTS. TOKENESTATE SA ASSUMES NO RESPONSIBILITY TO UPDATE FORWARD-LOOKING STATEMENTS OR TO ADAPT THEM TO FUTURE EVENTS OR DEVELOPMENTS.

ABSTRACT

Today, real estate transactions are conducted in ways which, by and large, have not yet been affected by the recent technology revolution. Investments in real estate can only be made through inefficient processes involving multiple intermediaries. As a result, it is unnecessarily costly and complicated for private investors to directly or indirectly own real estate assets.

With the recent rise to prominence of the blockchain, it is now possible for counterparties to exchange value in a decentralized and cost-efficient manner. Soon, private investors will have the possibility, through a website or mobile app, to efficiently invest in a variety of assets. The blockchain will disrupt transactions as internet has disrupted communications, and the transactional costs to invest will soon become marginal.

In this paper, we present a novel, lawful and practical way to apply the blockchain to real estate investments. Thanks to recent regulatory changes, it is now possible to develop 'Real Estate Tokens', whereby 'Tokenholders' are entitled to a share of the net profits generated by a portfolio of real estate properties owned by a 'Token Estate Investment Vehicle'. Compared with alternative investment vehicles, Real Estate Tokens are a much more efficient and liquid solution.

To launch Token Estate Investment Vehicles at scale, we are building a dedicated company: Tokenestate.io. The Marketplace will provide essential services to Token Estate Investment Vehicles, such as compliance with regulation, access to a community of investors and a suite of web and mobile tools. It will be the application layer between 'off-chain' real estate Investment Vehicles and 'on-chain' real estate investors.

Tokenestate.io was initiated by a highly qualified team of Swiss-based professional with deep expertise in real estate investments, investment vehicles compliance, Swiss and international law, banking IT systems, smart contracts, cybersecurity, digital marketing and entrepreneurship. Tokenesate.io immediate goal is to finance the development of the Marketplace, and to launch the first Token Estate Investment Vehicle in 2018.

Note to readers: this document provides a complete description of Tokenestate.io, and of the real estate market inefficiencies it addresses and the blockchain technologies it makes use of. It has been written for the non-specialist. Readers with prior knowledge of real estate transactions and of the blockchain can directly proceed to page 19.

SUMMARY

THE PROBLEM WITH INVESTING IN REAL ESTATE

1. THE REAL ESTATE ASSET CLASS

Investing in real estate is a near universal aspiration. The real estate asset class is recognized to be amongst the safest stores of wealth along with gold, and is a popular inflation hedge. It is backed by tangible assets which cater to one of the most essential human needs: have a shelter. To the wise investor, real estate assets are an essential component of a well-balanced portfolio, and can yield better returns than stocks or bonds in certain geographies and time periods.

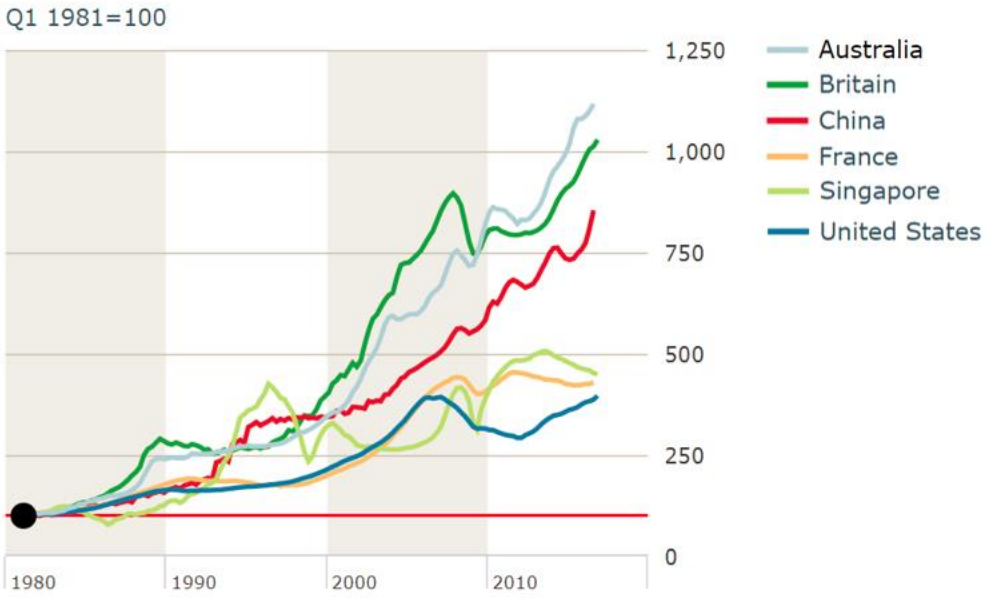

Figure 1 - Global House Price Index

Source: The Economist 2017

Today, real estate is the largest asset class in the world, valued at US$217 trillion dollars. This represents about 60% of all the world's assets, and is greater than the value of all the stocks and bonds combined. Yet it is one of the most difficult asset class to invest into, as only one third (US$81 trillion) of the global real estate asset are readily investible at scale, and the rest not accessible to public investors in any meaningful way.[1]

[1] Savills World Research – Around the World in Dollars and Cents - 2016

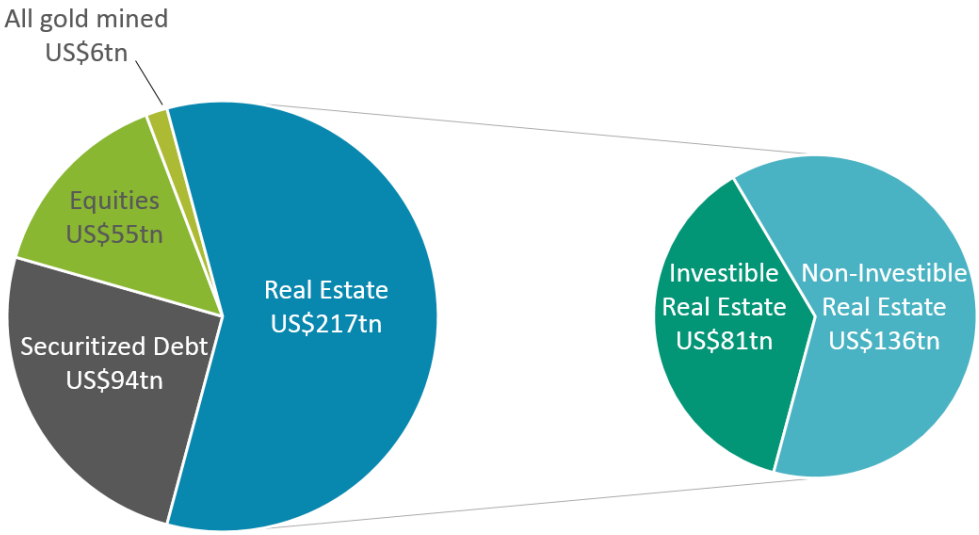

Figure 2 - Global Mainstream Asset Universe

Source: Savills World Research 2016

In other words, real estate is the most important component of the world's economy, yet it is one of least efficient to invest into. The main reason is because real estate investing is highly regulated, and consequently incur very high transaction costs. From the perspective of the retail investor, there are today four main ways to invest in real estate: (i) investing directly into an asset, (ii) purchasing shares in publicly listed Real Estate Investment Trusts (REITs) or (iii) entering into non-traded REITs (iv) invest through a crowdfunding platform.[2]

2. DIRECT INVESTMENTS IN REAL ESTATE

In today's world, specialized administrations and trade bodies rely on centralized land registries to manage property titles, and on sanctioned administrative processes to clear real estate transactions. These agents, registries and processes are the result of centuries of States evolution. They are playing an essential role, as their function is to help ensure that property rights are clearly defined, which is the bedrock of modern democracies and economies.

However, these legacy systems are highly inefficient and costly by today's digital, open-economy, standards. Monopolistic intermediaries, such as notaries in Latin regulatory regimes, are charging unnecessarily high transactions costs for changing ownership of properties.[3] In a 2009 study[4], the

[2] We do not discuss in this whitepaper Real Estate Private Equity funds, which are for institutional investors or High Net Worth Individuals, and therefore not an option for retail investors.
[3] OECD – Improving Competition in Real Estate Transactions - 2007
[4] OECD - Economic Surveys, European Union - 2009

OECD estimated that housing transaction costs are on average 5.7% for the buyer, as expressed in percent of property value, with notary costs accounting for almost half of this amount, and legal fee for a third.

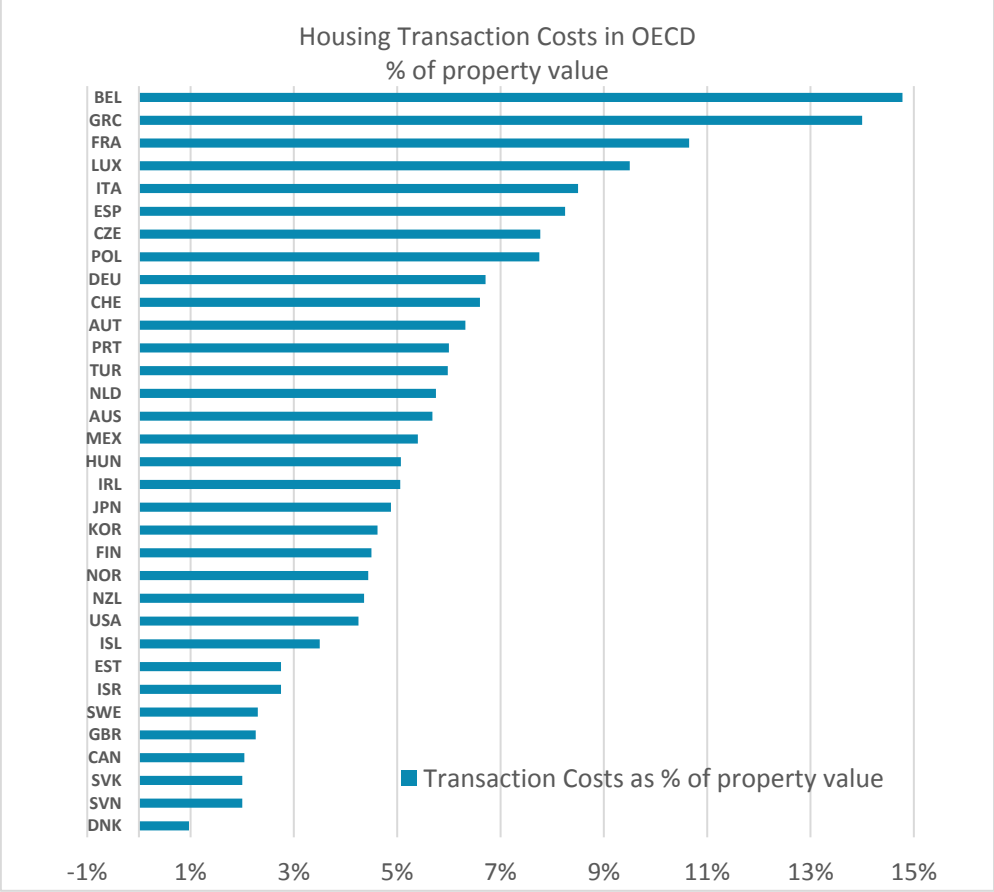

Figure 3 - Housing Transaction Costs in OECD

Source: OECD Economic Surveys 2012

In addition to being costly, real estate transactions are extremely time-consuming and stressful, as they require to interact with a variety of specialized professions, can be halted for weeks, and necessitate in-person meetings to conclude transactions. Managing real estate repairs is also a concern for retail investors who lack the expertise to properly evaluate the service provided by tradesmen such as builders, plumbers or electricians, and end up paying expensive maintenance fees as a result.

Finally, real estate investments are risky and capital intensive, as they typically require retail investors to commit substantial funds as the equity part of a single, localized, real estate asset. As with any undiversified investment, this leaves them exposed to steep losses should any localized event adversely impact the value of their property. Life savings can be wiped out if a chemical facility opens next door, or if a major employer leaves town.

In the wake of the 2008 economic crisis, the tighter credit environment and spiraling home prices have made it increasingly difficult for young professionals to step into the property ladder. But other societal factors played a role as well, such as changing career structures. Young generations are spending

longer in higher education, are more likely to move around to search for work, and have less free time available than ever before. This makes investing and owning real estate a burden less and less compatible with the time-starved and geographically mobile careers of today's young professionals.

The resulting drop in home ownership among the young lead to the formation of a 'rental generation', with the dream of home ownership slipping further away well out of reach for an increasing percentage of the population.[5] [6]

3. PUBLIC REAL ESTATE INVESTMENT TRUSTS

Over the past decades, alternatives have emerged to conducting direct investment: Real Estate Investment Trusts (REITs). REITs are legal structures that owns or finance properties that generate income, pay no taxes and distribute 90% of their earnings to shareholders.

These can be publicly traded or established privately between investors. While initially an American invention, public REITs are now available in many geographies, with their total market capitalization growing from US$734 billion in 2010 to US$1.7 trillion in 2016.[7] If anything, the recent success of public REITs underline the need to develop cheaper, and more efficient tools to invest in real estate.

Yet, Public REITs are only available through national stock exchanges which are managed by specialized economic actors, such as brokers and investment banks, whose self-serving behavior is well documented. In the US, banks such as Goldman Sachs and Morgan Stanley have been criticized for the lofty underwriter fees charged to bring firms public, which amount to 6 to 7% of the funds raised[8].

As recently as May 2017, the OECD has qualified the investment banks' high underwriting fees for raising capital akin to '*tacit collusion*'[9], noting that the "*median underwriting fee for US IPOs is 7%, and this has risen to 8% in Japan and China, doubling in the case of the latter (...). In the case of IPOs of less than USD 100 million, the average cost is 9% to 11% of the transaction. This means that for every 10 IPOs, the market value on an entire new company accrues to fees.*"[10]

Yet, IPO underwriting fees only account for less than half of the cost to bring medium-sized firms public in the US. Firms need to cover for one-time legal and external auditor fees directly related to the listing, as well as add extra operating expenses such as hiring new staff, pay fees to independent members of its board of directors or pay exchange listing fees amounting to several hundred thousand dollars per year. [11]

[5] U.S. Census Bureau, Current Population Survey & Housing Vacancy Survey – February 21, 2017
[6] Eurostat - Urban Europe statistics on cities, towns and suburbs — April 2016
[7] EY – Global Perspectives: 2016 REIT report
[8] Dealbook Nytimes - High I.P.O. Fees Weigh on U.S. Firms, Study Finds - 2012
[9] Reuters News - OECD says IPO underwriting fees "akin to tacit collusion" – May 30, 2017
[10] OECD Business and Finance Outlook 2017
[11] PWC - Considering an IPO? The costs of going and being public may surprise you – September 2012

In addition, investors incur significant expenses to trade on public exchanges when using retail banking platforms. In Switzerland for example, UBS charges 1.9% and a minimum fee of CHF120 (US$124) to place an order on the NYSE or the NASDAQ.

4. NON-TRADED REAL ESTATE INVESTMENT TRUSTS

Non-traded REITs are investment vehicles designed to reduce or to eliminate tax, while providing exposure to real estate assets. It is subject to the same rules as the as the public REITs, which include returning at least 90% of taxable income to shareholders. As non-traded REIT do not trade on a securities exchange, they do not incur the exorbitant IPOs and listing fees incurred by their public counterparts.

Yet these are highly illiquid investments, with steep front-end fees which are typically above 10% and up to 15% of the offering price. In addition to these high up-front fees, Non-traded REITs may have significant transaction costs, such as for property acquisition or for early redemption of shares.

Craig McCann, a former economist with the US Securities & Exchange Commission (SEC) stated in 2014 that *"Nontraded REITs are costing investors, especially elderly, retired, unsophisticated investors, billions. They're suffering illiquidity and ignorance, and earning much less than what they ought to be earning. (...) No brokerage should be allowed to sell these things."*[12]

In 2015, the SEC issued an investor bulletin on Non-traded REITs[13]. In addition to the high-fees, the SEC noted that Non-traded REITs are highly illiquid investments, which might not be sold until more than 10 years after the initial investment. It also noted that the early profit distributions used to attract investors may come from the funds raised from the initial investors (which is one of the characteristics of a Ponzi scheme), that these vehicles did lack share value transparency, and could be subjected to conflicts of interest.

After such bad press in the United States, the Non-traded REITs experienced a sharp contraction in their fundraising, from a peak of US$19.6bn in 2013 to US$4.7bn estimated in 2017[14].

[12] The Wall Street Journal - Nontraded REITs Are Hot, But Have Plenty of Critics – June 15, 2014
[13] U.S. Securities and Exchange Commission – Investor Bulletin: Non-traded REITs – August 31, 2015
[14] The Stanger Market Pulse - 2017

5. REAL ESTATE CROWDFUNDING PLATFORM

Real estate crowdfunding has recently gained popularity across geographies and in the United States following the Jumpstart Our Business Startups (JOBS) Act in 2012. There are today dozens of real estate crowdfunding platforms in operation worldwide.

While initially the JOBS opened the door for accredited investors only, i.e. with a net worth of at least a US$1m, the rules were recently relaxed by the SEC in 2017 to allow US crowdfunding platforms to raise funds from accredited and nonaccredited investors alike.

While these successes are encouraging they remain extremely limited in scale, with (estimated) US$3.5bn raised in 2016 by real estate crowdfunding platforms in the US[15], to be compared with US$69.6bn in funds raised by US public REITs during the same year.[16]

There was a similar development in Singapore, with the Monetary Authority of Singapore relaxing rules for crowdfunding platforms in June 2016[17]. However real estate crowdfunding platforms do not represent a significant volume of capital in Singapore so far, or for that matter in Asia.

Besides their relative novelty, the reason is because crowdfunding platforms suffer from two limiting factors. First, they generally cannot invest in existing real estate assets, least they'd become investment companies and sell securitized assets. They generally only finance new property developments. Second, their investment cannot be traded daily like a stock, and are therefore highly illiquid. Depending on the nature of the project, investors can expect to have their money tied up in an investment from one to up to seven years.

[15] Crowdsourcing.org - 2015CF-RE Crowdfunding for Real Estate - 2015
[16] U.S. National Association of Real Estate Investment Trusts – 2016 Data, covering IPOs, secondary issuances & debt.
[17] Monetary Authority of Singapore - MAS to Improve Access to Crowd-funding for Start-ups and SMEs – June 8, 2016

6. WHY WE NEED TO MAKE REAL ESTATE INVESTMENTS MORE EFFICIENT

As exposed above, the current options available to invest in real estate are costly, inefficient and risky.

Type	Pros	Cons
Direct Investment	• Can live in it	• Expensive transactions • Capital intensive • Undiversified investment • Time-consuming • Illiquid
Public Real Estate Investment Trusts	• Easier to invest into • Diversified	• Expensive IPO & listing fees • Costly to trade for individual investors • Unavailable in some geographies
Non-traded Real Estate Investment Trusts	• Easier to invest into • Diversified	• Expensive entry fees • Highly illiquid vehicles
Crowdfunding Platforms	• Easier to invest into	• Limited to certain types of real estate (i.e. new property developments) • Small volumes of transactions

Figure 4 - Comparison of current real estate investment vehicles

Social & economic costs. While the world at large experienced a dramatic increase in productivity across all sectors in the past decades, the cost of processing real estate transaction has remained unchanged, and bound to century-old practices largely unaffected by technology.

In many geographies, land registries can easily be corrupted, and the lack of secured property rights is an endemic source of injustice. Shoddy property rights make it costlier to trade real estate, or to use it as a collateral. The administrations, banks, brokers or notaries which democracies have entrusted to manage transactions have taken advantage of their monopolistic positions to extract unacceptably high fees from investors.

In these times of growing inequalities, the societal cost is immense. High transaction costs result in lower geographic mobility, and make it harder for the jobless to find work, as pointed by an OECD study in 2011[18]. The up-and-coming 'rental generation' which hasn't been able to invest in real estate as their

[18] The Economist – The princes of paperwork – May 19, 2015

parents did, are left out of a key wealth creation vehicle. Investor resorting to public or non-traded REITs have paid billions in unnecessary fees.

Realizing the 'liquidity premium'. High transaction costs also have another economic side-effect: they create an 'illiquidity discount'. The more trading is expensive, the less trading there is, and the less liquid the market becomes.

One of the characteristics of illiquid markets is their wide bid-ask spread: one needs to sell cheap to entice buyers to come (i.e. the illiquidity discount), and to buy dearly to find any willing sellers. Should real estate markets become more efficient, the bid-ask spread would narrow, and it would benefit from the so-called liquidity premium: real estate sellers would be able to get better price for their assets.[19]

While the liquidity premium is hard to quantify, releasing a few percentage points of value in an asset class as big as real estate would be a major value creation event for any country undertaking it.

[19] Hacker Noon – Traditional Asset Tokenization by Stephen McKeon – August 11, 2017

THE BLOCKCHAIN AS THE ULTIMATE DESINTERMEDIATION TOOL

1. CRYPTOCURRENCIES AND THE BLOCKCHAIN

Thanks to the work of Satoshi Nakamoto and of the cryptocurrency community, the world has now a functioning protocol to process transactions in a cost efficient and decentralized way: the blockchain. Blockchain protocols are based on two key technological enablers: cryptographic keys to authenticate participants, and 'proof-of-work'[20] puzzles to evenly distribute the processing of these transactions to market participants.

Cryptographic keys come in pairs: the public key and the private key. The private key is used to sign transactions, and the public key to authenticate signatures. To take a real-world comparison: when one signs a document with its hand (private key), the counterpart can verify the signature using an ID document (public key). While in the real world a signature is cumbersome to verify and relatively easy to fake, the Elliptic-Curve Cryptography (ECC) used in blockchain are secure enough to resist hacking and extremely easy to implement digitally.

As Vitalik Buterin wrote in a December 2016 post: "*Cryptography is truly special in the 21st century because [it] is one of the very few fields where adversarial conflict continues to heavily favor the defender. Castles are far easier to destroy than build, islands are defendable but can still be attacked, but an average person's ECC keys are secure enough to resist even state-level actors.*"[21] Cryptocurrencies use public keys as account numbers[22]: market participants can easily verify that the account owner, which is in possession of the private key, has signed any outgoing transactions from his account.

'Proof-of-work' puzzles serve as the mechanism to distribute authority to network participants. In the real world, there's a central entity which has the authority to accept or reject transactions, for example central banks or clearing houses. Its role is to ensure, among other things, that assets are not stolen or spent twice. It is rewarded for its work by charging a fee. With the blockchain, decentralized market participants processing transactions (i.e. 'miners') are also rewarded for the work provided. For every transaction confirmed by a miner, it receives a certain amount of cryptocurrency.

Yet to reap the reward, the miner needs to solve a mathematical puzzle which changes according to the transaction being processed, and that can only be solved by randomly trying different combinations. As a result, miners' ability to process transactions depend on their capacity to solve the puzzle, which in turn depend on their processing power. Thus, the authority to clear transactions in the network is evenly and randomly distributed amongst market participants according to their processing power. Because the cryptocurrency underpinning the reward would lose value should the blockchain becomes corrupted, all market participants have a vested interest in behaving according to

[20] The alternatives to proof-of-work are not discussed in this paper for simplicity stake
[21] Medium - A Proof of Stake Design Philosophy by Vitalik Buterin – Dec 31, 2016
[22] That is a simplification, as on Ethereum account numbers are the first 160 bits of the public key hash

the rules defined in the blockchain protocol. And as the protocol is open-source and virtually anyone in the world can become a miner, the blockchain is less likely to become dominated by a single actor, and transaction fees more likely to be driven by open market forces.

In practice, blockchain protocols call for transactions to be bundled in blocks, to facilitate its processing, and the mathematical puzzle difficulty is adjusted according to the available processing power to ensure that new blocks are processed at regular intervals. For a block to be valid, the answer to the mathematical puzzle (i.e. the 'nonce') must be valid, each transaction in the block must be valid, and the block must reference the contents of a valid prior block belonging to the longest valid branch of the blockchain[23]. As a result, blocks of transaction are chained one to the next, hence the name blockchain. Physically, the blockchain is a digital database of transactions, which is stored on miners' computers around the world and is easily accessible to the public.

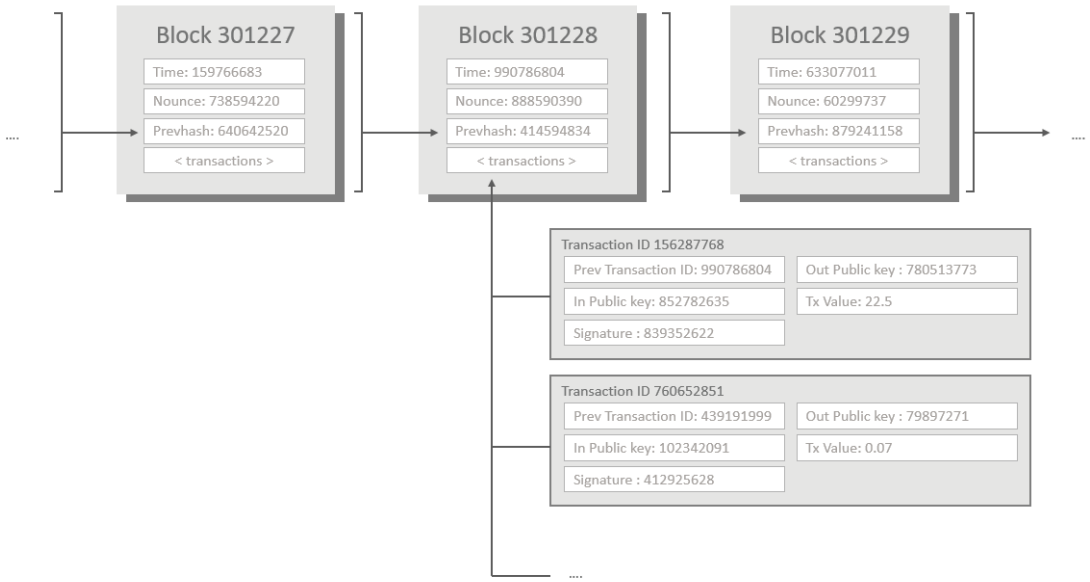

Figure 5 - Blockchain Schematic

If the cumulated processing power of market participant is large enough, solving the mathematical puzzle is extremely hard, as it requires to test an extremely large number of nonces. Once a block has been deemed valid by market participants, and many subsequent blocks added to the chain, it becomes near-impossible for a malicious miner to modify one transaction on that block. Indeed, changing a particular transaction would change the block content, which in turn would change the content of all the subsequent blocks in the blockchain. This would require the malicious miner to solve many mathematical puzzles by itself to 're-write' the blockchain, while playing catch-up with the rest of the miners which continue to work on the longer 'legitimate' blockchain.

Because the blockchain removes all intermediaries, transferring funds from one address to another is extremely cheap. The current cost to process a transaction using the Ethereum blockchain is US$0.038.[24] As a single point of comparison, the cost to place an international money transfer using

[23] This is the case for Bitcoin. Ethereum is slightly different
[24] ethgasstation.info – October 1, 2017

the UBS e-banking platform is CHF5 (US$5.16). Transferring funds using Ethereum is over a 130x cheaper than using UBS.

Thanks to the mass adoption of cryptocurrencies in recent years, the world now disposes of a simple yet extremely secure and cost-efficient way to digitally store and exchange value, and to create an unalterable record of past transactions.

2. TOKENS AND SMART CONTRACTS

Cryptocurrencies, such as Bitcoin, were amongst the first blockchain applications to be launched. However, the most important disruption does not come from the ability to conduct transactions, but to execute programs in a secured and decentralized fashion. In a 2013 seminal paper[25], Vitalik Buterin laid out the foundations of Ethereum, a blockchain-based distributed computing platform. While on the Bitcoin blockchain participants are (mostly) limited to processing simple transactions, the Ethereum blockchain supports a much broader set of computational instructions, enabling participants to code and execute much more complex scrips: the smart contracts.

Simply put, smart contracts are intended to be the digital equivalent of their paper counterparts: a set of instructions governing the interaction between parties according to certain external inputs. For example, it is possible to code a farm insurance scheme with a smart contract. Farmers contribute funds to an account, and payments are automatically released to farmers affected by specific meteorological events. If the meteorological data can be fed into the smart contract from a secure digital source, its execution can be done without human intervention and according to the pre-programmed rules. Other uses cases of smart contracts abound, such as the hedging of foreign exchange risk, the recording of land titles, or the payment for rental vehicles to name but a few examples.

In addition, smart contracts can generate their own digital 'tokens' which can be stored and traded on the Ethereum blockchain. In the most basic use case, tokens can be akin to cryptocurrencies, and be a store of value and a mean of exchange for the participants in the smart contract. But they can support many other functionalities, such as give tokenholders voting rights (i.e. voting tokens), or enable them to access a service (i.e. utility tokens). Companies might create tokens corresponding to real world (i.e. 'off-chain') assets, and recognizing tokenholders as the legal owner of these assets (i.e. asset-based tokens).

Companies might grant tokenholders a percentage of their profits (i.e. equity tokens), decide to reimburse tokenholders for funds lent according to a pre-defined schedule (i.e. debt-tokens), assign to tokenholders a share of revenues incurring from certain intellectual property rights (i.e. IP rights

[25] Ethereum White Paper – Next Generation Smart Contract & Decentralized Application Platform by Vitalik Buterin - 2013

tokens). In short, tokens can be designed to replicate the risk and revenue profiles of corporate debt, shares or IP licenses – or even to create hybrids of all these instruments.

3. A MATURING LEGAL ENVIRONMENT

As anyone can code smart contracts and sell tokens to investors using the Ethereum blockchain, there has been a recent spike in fundraising by startups through so-called Token Generation Events (TGEs) or Initial Coin Offerings (ICOs).[26] The market went boom in China, with Chinese tech firms raising US$766m worth of crypto-currencies in local ICOs in July and August 2017 alone.[27] Worldwide, nearly US$2.3bn have been raised in the year to date, which fueled a massive increase in the market capitalization of cryptocurrencies which went up from US$18bn to over US$140bn in the past 9 months.

China & South Korea. The recent popularity of ICOs forced financial authorities to react. As crooks and hackers flooded the market with scams in search for a quick profit, Chinese and South Korean authorities recently took the decision to ban them altogether.

USA. In the US, ICOs are not banned, but local authorities have taken a heavy-handed regulatory approach which makes it difficult for blockchain businesses to operate. In the State of New York for example, blockchain companies are required since June 2015 to get a license (the much criticized 'BitLicense') to operate, which is only awarded after a long and time-consuming application process. To make matters worse, the NY Department of Financial Services, which enacted the BitLicense, couldn't efficiently process applications due to the departure of key staff shortly after the BitLicense was put in place.

As of January 2017, only 3 BitLicenses have been granted in NY[28]. More recently, the US SEC published an investigative report concluding that DAO tokens were securities and therefore were subject to the US federal securities laws.[29] The resulting legal uncertainty, and the fact that blockchain businesses require state-by-state licensing in the US, has clearly acted as a deterrent for blockchain businesses to operate in the country.

Yet, other geographies, recognizing the future potential of technology, have taken more innovation-friendly steps with the objective to create competitive domestic blockchain FinTech (financial technology startups) clusters.

Switzerland. The country has long been engaged in regulatory competition with other banking centers such as New York, the City of London, Frankfurt, Amsterdam, Dubai or Singapore. Indeed, following the

[26] Initial Coin Offerings are also referred to as Token Generating Events (TGE) by certain market participants. For clarity purposes we will use in this paper the acronym ICO to describe the act of generating and selling blockchain tokens, as it is by far the most widely used terminology today.
[27] Forbes - China's ICO Ban Doesn't Mean It's Giving Up On Crypto-Currencies – September 6, 2017
[28] Coinbase - Bitcoin Exchange Coinbase Receives New York BitLicense – January 17, 2017
[29] U.S. SEC - SEC Issues Investigative Report Concluding DAO Tokens, a Digital Asset, Were Securities – July 25, 2017

recent loss of the banking secrecy laws, the development of FinTech startups in the country is seen by many as a way to acquire an edge against other banking centers. The country is famous for hosting leading blockchain startups such as the Ethereum Foundation, MyEtherWallet, ShapeShift or Bancor.

In a seminal 2015 speech[30], the CEO of the Swiss Financial Market Supervisory Authority (FINMA) declared: "*We have a vital interest in developing and adapting regulation to the needs of a digital world. And I reiterate: FINMA regards innovation as a key factor in the competitiveness of the Swiss financial center. (...) We at FINMA are adapting our regulations to accommodate FinTech. We are also seeking to influence the legislative framework in a positive way. An innovative financial sector is in all our interests.*"

These were more than mere words as the FINMA proceeded swiftly to revise in 2016 the Anti-Money Laundering Ordinance to enable video and online client identification, so as to facilitate the operations of start-up companies which can now easily onboard investors digitally.[31]

A major development occurred in July 2017, with the '*The amendment to the Banking Ordinance*'.[32] From this moment onwards, Swiss companies can accept funds for settlement for up to 60 days without a banking license, instead of 7 days under prior regulation. This exception is intended to facilitate the operation of crowdfunding platforms, which can then accept funds during month-long crowdfunding campaigns without requiring an expensive Swiss banking license. This is a major development for crowdfunding businesses in Switzerland and around the world.

In September 2017, it further clarified the rules to raise capital using ICOs noting that "*ICOs are currently not governed by specific regulations, either globally or in Switzerland. (...) Collecting funds for one's own account without a platform or issuing house is unregulated from a supervisory perspective in cases where repayment is not obliged, payment instruments have not been issued and no secondary market exists.*" The FINMA also noted that certain regulations related to Anti Money Laundering, securities trading or collective investment schemes might apply to certain types of tokens.[33] The FINMA also took steps to clear the Swiss market of scams, and proceeded to liquidate several Swiss entities issuing fake cryptocurrencies which were not relying on blockchain technology.

These recent developments have been well received by the Blockchain community in the country, as FINMA's guidance clarifies the rules applicable to cryptocurrency tokens, and these will enable blockchain startups to conduct compliant ICOs in Switzerland in the future.

Singapore. The government and the Monetary Authority of Singapore (MAS) have adopted a similar blockchain-friendly approach. The MAS launched in 2016 the so-called Project Ubin, along with a consortium of banks, to conduct proof-of-concepts using blockchain to process payments.[34] It is

[30] FINMA - Speech to the Zurich Business Club – September 10, 2015
[31] FINMA – FINMA reduces obstacles to FinTech – March 17, 2016.
[32] Swiss Federal Department of Finance - Federal Council puts new fintech rules into force – July 5, 2017
[33] FINMA - FINMA is investigating ICO procedures – September 29, 2017
[34] Monetary Authority of Singapore - Project Ubin: Central Bank Digital Money using Distributed Ledger Technology

positioning itself as a hub for blockchain development in commodity trading.[35] The MAS is investing S$225m (US$166m) to develop FinTech projects and applications.

In June 2016, the MAS simplified the regulation applicable to securities-based crowdfunding platforms. Fundraising for projects raising less than S$5m can be done without issuing a prospectus, and retail investors can participate. Crowdfunding platform operators which only raise funds from accredited and institutional investors now can do so with a lower base capital (S$ 50k instead of s$250k)[36].

More recently in August 2017, the MAS issued a note clarifying the rules applicable to digital tokens, noting that tokens will be regulated in Singapore should they "*constitute products regulated under the Securities and Future Act*". In particular it underlined that such tokens representing ownership over a property, and therefore might be considered as units in a collective investment scheme.[37]

It is also taking corrective actions and accounts of cryptocurrency firms in Singapore have been recently been frozen, most probably because of Anti-Money Laundering rules. [38]

Dubai. The United Arab Emirates (UAE), and the Emirate of Dubai in particular, are embracing blockchain technology in a very resolute fashion. Symbolically, the Dubai Government recently launched the first official government-backed cryptocurrency: emCash. These tokens will be considered legal tender in Dubai.

Recently, the first real estate transaction using Bitcoins was conducted in the Emirate of Dubai, in a move which is foreshadowing direct transfer of property ownership using the blockchain according to local observers.[39]

Gibraltar. Recently, Gibraltar's Financial Services Commission published a draft of its upcoming regulatory framework governing firms offering blockchain services, which will apply to any commercial use of the blockchain to store and transmit '*value*' defined as '*assets, holdings, or other forms of ownership, rights or interests.*' Firms offering blockchain services will be provided a working license, provided they apply relatively general business principles, maintain high security standards, and put in place Anti Money Laundering controls.

Conclusion. With blockchain ICOs raising hundreds of millions of dollars, and financial authorities around the world finally clarifying regulations applicable to ICOs and blockchain businesses, 2017 will remain a major milestone towards the establishment of a token-based economy.

Crucially, the latest regulatory developments point to a near future when issuing a blockchain token as mean to transfer the property of assets, such as real estate or securities, can be done in a lawful and compliant manner in several leading financial jurisdictions.

[35] Reuters - Blockchain booster: Singapore eyes commodity fintech firms – September 26, 2017
[36] MAS - MAS to Improve Access to Crowd-funding for Start-ups and SMEs – June 8, 2016
[37] MAS - MAS clarifies regulatory position on the offer of digital tokens in Singapore – August 1, 2017
[38] Bloomberg - Singapore Cryptocurrency Firms Facing Bank Account Closures – September 26, 2017
[39] The Cointelegraph - How You Can Buy Apartment in Dubai for Bitcoin – September 7, 2017

APPLYING THE BLOCKCHAIN TO REAL ESTATE INVESTMENTS

1. CURRENT TRENDS

The rise of 'PropTech' startups. Real estate is a fragmented, conservative industry, which operates in ways that can feel incredibly archaic and inefficient for all involved. While over the past couple of decades social networking, online shopping, short term rentals and video streaming have profoundly altered what people do within or with their homes; the real estate industry at large has been globally unaffected by technology.

This lead to entrepreneurs and Venture Capitalists seeing the space as ripe for disruption, and to the recent emergence of Property Technology ('PropTech') startups in the past couple of years. In the 12 months leading to August 2017, 108 real estate focused startups have raised more than US$400m in seed or early stage rounds in the US alone.[40] Many investors now look at the space as a low-hanging fruit.

Using the blockchain to secure land registries. Many governments and startups around the world have recently announced projects to deploy the Blockchain on one of its most obvious uses cases: securing land registries. So far projects have been announced in the following geographies: Georgia, Ukraine, Sweden, Estonia, Ghana, Rwanda, Brazil, Dubai, the Indian state of Andhra Pradesh. We see such initiatives as the initial steps to the much wider adoption of blockchain-based solutions to secure property titles, and leading to further changes in the way properties are traded, rented and managed in the more distant future.

2. OTHER REAL ESTATE BLOCKCHAIN STARTUPS BENCHMARKING

As exposed previously (cf. page 16), the uncertainty surrounding the legality of issuing asset-backed tokens has been a major hinderance to their deployment and market acceptation in some geographies, most notably in the US.

As a result, most real estate blockchain ventures recently funded have opted for a 'currency' token design, whereby their token is solely used as a medium of exchange. For example, Real Markets, a Spanish-staffed Singapore-based startup, or LAToken, most probably based out of Russia[41], have opted to create proprietary platforms which enable participants to invest in real estate assets but only by

[40] Data from crunchbase.com – August 2017

[41] No company address or incorporation information is available on the LAToken website at the time of writing, but key staff is based in Russia.

using their own currency token. By creating 'currencies', the initiators behind these ventures seek to simplify the regulation applicable to their token, as currency tokens are more lightly regulated than other kind of tokens.

Yet we believe that such design choices are profoundly flawed: real estate assets on their platform are not free to exchange, but locked into proprietary platforms and thus submitted to company-specific operational, economic and political risks. Such ventures fail to realize one of the most interesting promises of real estate tokens: make them available on a variety of exchanges in a decentralized fashion.

In addition, the currency tokens provided by both these companies are governed by very uncertain supply and demand flows linked to the investment or divestment opportunities provided on their respective platforms. The rational investor willing to invest in real estate through their proprietary platforms has an incentive to hold their tokens for as little time as possible, which will result in very high volatile token prices and thus defeat the very purpose of investing in safe real estate assets.

Last but not least, the rights granted to investors by such currencies are extremely weak. There is limited or no recourse for investors should the issuer fails to deliver on its promise. Effectively, all the investments performed through such platforms are subjected to the issuer counter party risk, which often times.

Despite such concerns, both LAToken and Real Markets were successful in collectively raising tens of millions of dollars during their ICOs.

3. ABOUT TOKENESTATE.IO

Our goal. Tokenestate.io objective is to facilitate investing in real estate by creating a new investment standard: the Real Estate Tokens or RETO.

A RETO is:

1. a regulated financial instrument or security, such as a share, a participation certificate, or a credit note
2. issued by an entity owning real estate assets
3. represented by a blockchain-based token.

By purchasing RETOs, investors will gain exposure to the real estate assets owned by the issuing entity. Because RETOs are securities, investors will benefit from the protection of existing financial regulation which will provide them with strong, enforceable, rights.

Because RETOs are presented by blockchain tokens, it will be easy for investors to buy and sell them, and they will enable issuers to take advantage of the operational efficiencies of the blockchain. (cf. '*Real Estate Tokens (RETOs)*' section page 27).

Token Estate Investment Vehicles (TEIVs). Each RETO will be issued by a Special Purpose Vehicle, a legal entity specifically created to this end. We call such entities Token Estate Investment Vehicles (TEIV). Each TEIV will be the legal owner of a portfolio of real estate assets and will run its business like any REIT does. It will take informed decisions on property acquisition or divestment, manage these properties, ensure compliance with any applicable regulation.

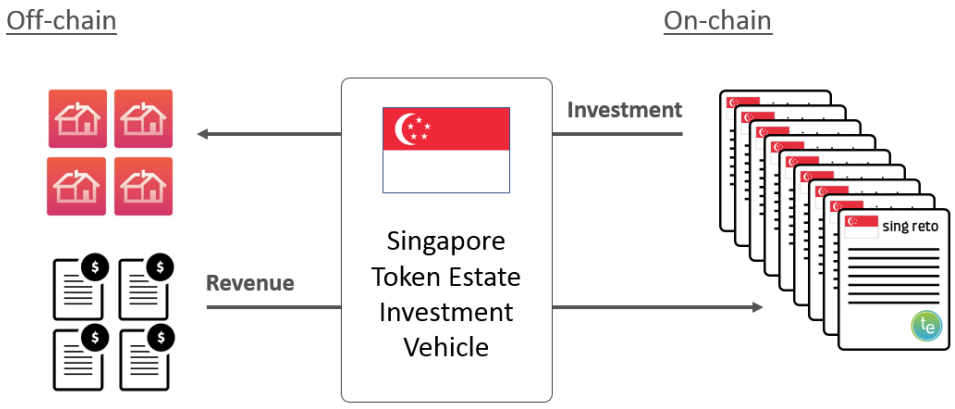

Figure 6 – Singapore TEIV conceptual view

As an example, we can imagine a Singapore TEIV, a legal entity which owns a portfolio of commercial and residential real estate in Singapore. To finance the acquisition of this portfolio, the Singapore TEIV has been issuing a RETO to investors during a Security Token Offering (STO). From a legal standpoint, let's assume that the RETO issued by the Singapore TEIV is a 'Participation Certificate' - in other terms a non-voting share.[42]

The RETO holders are granted a part of the dividends paid out by the TEIV at par with the shareholders, so that one share receives the same dividend as one RETO. Conceptually, if the capital structure of the TEIV is composed of x shares and y RETOs, a dividend d will lead to a payout of $d / (x + y)$ per RETO issued.[43]

In comparison with a 'public' REIT, a Token Estate Investment Vehicles will have the following benefits:

a. Lower issuance costs. The cost to launch a TEIV will be much lower than to perform an IPO, as there won't be the need to pay banks' underwriter fees, or exchange listing costs.
b. Lower trading costs. Purchasing RETOs will be much less costly than existing alternatives, as they can be exchanged on the blockchain. The current cost to exchange (any number of) tokens on the Ethereum blockchain is approximately US$ 30 cents.[44] In addition, it is much more practical to trade tokens than to trade stocks, as it does not require to open (and maintain) a bank or brokerage account.
c. Greater liquidity. TEIVs will be more liquid than REITs. They cost much less to trade, do not require to own a bank or a trading account. Investors can choose to invest as little as they want in it.

[42] RETO can represent other securities as well, such as a credit note or a common share.
[43] Not taking into account possible withholding taxes on dividend payments.
[44] myetherwallet.com & ethgasstation.info – October 1, 2017

d. Access to cryptocurrency investors. The Cryptocurrency market represent today a pool of capital over US$130bn. It is probable that this pool will continue growing as cryptos and tokens gain in popularity. Crypto investors are less likely to invest in real estate through a listed instrument, than to do so through a token. In addition, Crypto investors are today exposed to very high market volatility, and real estate is a naturel safe haven for investors.
e. Greater transparency. TEIVs will be much more transparent than REITs, as all the documents related to the investment can be securely published on the blockchain (as detailed in the '*Real Estate Tokens (RETOs)*' section, page 27). Transparent TEIVs will enhance liquidity, as investors will be more confident in trading them, and result in more accurate prices, as more market participants can arbitrage price differences between the RETOs price and the value of the underlying portfolio of properties.

RETOs to be tradable on a variety of exchanges. Once launched, RETOs can be traded on any compliant exchanges, or in a decentralized fashion between investors. The trading of RETOs will not be limited by design to be performed only on a particular platform or exchange. Indeed, it is our conviction that for RETOs to be successful, they cannot be locked by design into a specific proprietary platform. That is an essential feature, as a 'Real Estate Token' which cannot be traded outside of a proprietary platform is not truly a 'Token'.

Recurring costs to launch a TEIV and to sell RETO. Launching a Token Estate Investment Vehicle by selling RETOs through an ICO will incur numerous one-time costs. The legal entity performing such services will have to comply with regulation, and obtain certain licenses to operate in certain geographies. For the ICO to be a success, it will need to be addressed to an existing community of investors with interests in TEIVs. Specific mobile app and websites will need to be developed. In short, using the same legal entity to launch several TEIVs will result in important economies of scale.

The Tokenestate.io Marketplace. So, to launch TEIVs in an economically efficient way, it is necessary to regroup essential services such as compliance and launching services into a dedicated legal entity, which will be used to launch many TEIVs, leading to significant economies of scale. We call this legal entity Tokenestate.io. It is a for-profit marketplace, which will perform services to TEIVs in exchange for fees.

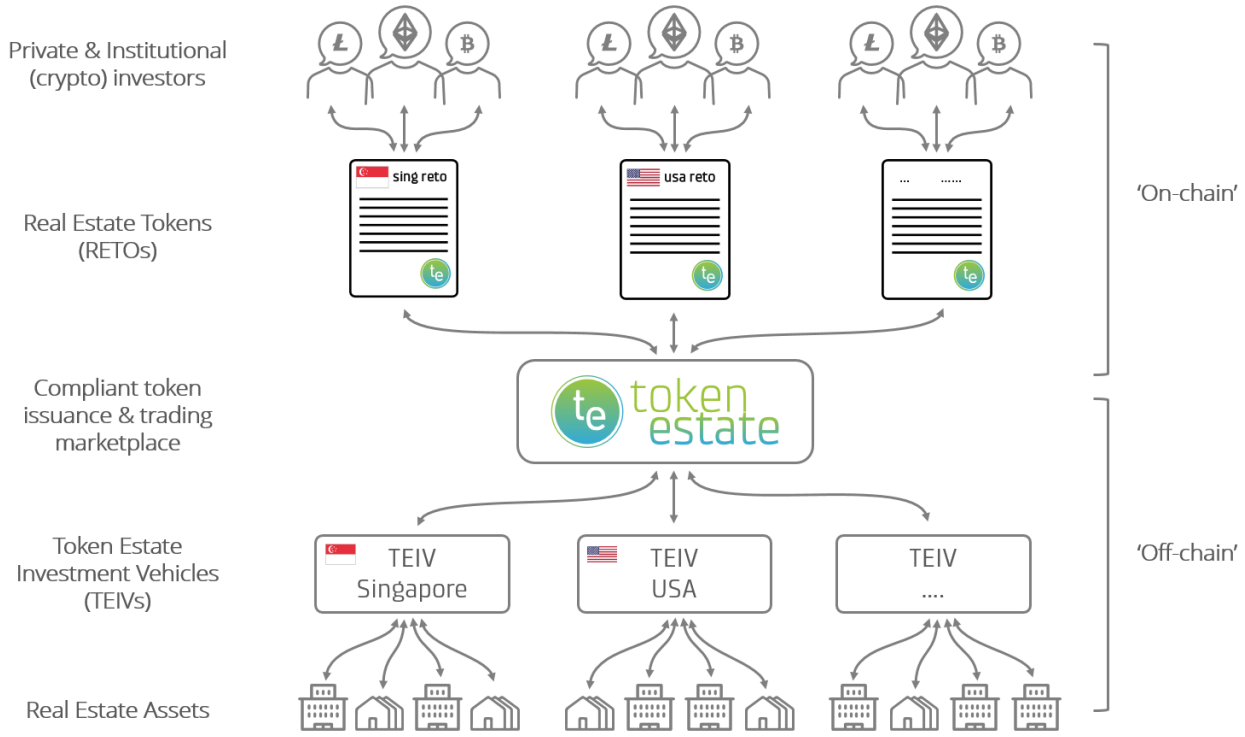

Figure 7 - Conceptual view of Tokenestate.io, TEIVs & RETOs

In short, the Tokenestate.io is to TEIVs what Kickstarter is to startups: a widely recognized platform offering a complete suite of services, compliance with regulation, and access to a wide community of investors.

Relationship between Tokenestate.io and TEIVs. Tokenestate.io will be open to any exiting real estate business engaged in developing, acquiring and managing real estate property, such as real estate funds or trusts.

Tokenestate.io is designed to be the application layer between existing 'off-chain' real estate funds, trusts or developers; and the new 'on-chain' economy made possible by the blockchain. However, Tokenestate.io will conduct a stringent and in depth due-diligence on each fund or project through a dedicated application process.

Not-for-profit Token Estate Investment Vehicles. This being said, and because we believe that business is a force for good, Tokenestate.io will also support a number of projects chosen for their social or ecological impact. Indeed, as recently demonstrated by the destruction brought forward by hurricanes in the Caribbean or by the earthquake in Mexico, it is at time necessary to quickly channel financial resources to support critical infrastructure reconstruction efforts. While these projects will be materially riskier to invest into, we believe that investors will have non-economic interests in supporting them, as much as we do. Tokenestate.io will wave or materially reduce its fees for such projects.

4. TOKEN ESTATE INVESTMENT VEHICLES (TEIVS)

Token Estate Investment Vehicles (TEIVs) duties are by and large similar to those of existing REIT or real estate asset managers. It is our expectation that companies and professionals operating in this field today will launch and manage TEIVs in the future. Schematically, a TEIV has, like a REIT, the following duties:

a. Operate within a clear mandate and define the on-going investment strategy according to local market conditions.
b. Sourcing opportunities & perform due-diligence on opportunities and business partners.
c. Execute flawlessly real estate developments, transactions, improvement works or divestments.
d. Manage properties, directly or indirectly, to maximize long term-value.
e. Fulfill compliance & reporting obligations as required by authorities

Yet there are fundamental differences between REITs and TEIVs:

f. Greater operational transparency. TEIVs will be much more transparent and disclose much more information to investors than REITs do. Indeed, we believe that every investor should have the right to perform a complete due diligence on each TEIV. We're designing the RETOs tokens to easily provide access to such information, and prevent tampering with past published information (cf. '*Real Estate Tokens (RETOs)*' section page 27).
g. Oversight by the Tokenestate.io. TEIVs will be subjected to an oversight by Tokenestate.io and enter into legally binding agreements with the Tokenestate.io prior to ICOs taking place. Indeed, one of Tokenestate.io duties is to defend the interests of the RETO tokenholders, should the TEIV fail to perform their obligations towards them.
h. Obligations towards tokenholders. Each TEIV will have certain obligations towards investors which purchased its RETO (i.e. the 'tokenholders'). These will be spelled out in the Terms & Conditions of the RETO sale, and enabled into the associated Smart Contract. While these obligations might vary depending on the legal and market environment in which the TEIV operates, it is our expectation that these will include: (i) an obligation to issue a payment to the tokenholders should a dividend payment be made to the shareholders and (ii) the obligation to consult the tokenholders by means of a vote for certain types of decisions to be taken by the fund (iii) the obligation to report information on its operations and investments.

While every Token Estate Investment Vehicle can establish its own strategy, and apply to be listed on Tokenestate.io, it is our expectation that they will have the following characteristics[45]:

a. Being managed by real estate professionals with a significant experience in the geographies were the TEIV is to operate. Managing teams will be able to demonstrate a successful a track record, an intimate knowledge of the local market, and technical and legal capabilities.
b. Have a sound investment strategy taking into account local and global market dynamics, societal and economic drivers and legal and operational considerations. Strategy is to be targeting well-known asset classes (residential, commercial) in defined geographies, specifying the type of assets targeted (e.g. core opportunistic, distressed assets) while clearly defining revenue objectives (rental and/or capital gains) both quantitatively and qualitatively.
c. Being able to perform thorough due-diligences and risk assessments on the sustainability of the rental income, the validity of the property titles, the durability and quality of the object, the attractivity of the project according to its design and location, the professionalism of partners and contractors.
d. Being open-ended as we anticipate TEIVs to grow as they become known and have a well-documented track record and investor base. The design of the RETOs will address this specific point by enabling 'locked' RETOs to be sold under certain conditions, so as to increase the TEIV's assets under management. (cf '*Real Estate Tokens (RETOs)*' page 27)
e. Use leverage to enhance returns. In real estate a large part of the net profits arises from the use of debt. We expect TEIVs to cautiously finance portfolio acquisitions through the issuance of long-term debt, in line with industry practices.

Conceptually the lifetime of a Token Estate Investment Vehicle will be composed of the following stages:

a. During the qualification phase, the TEIV promoters will provide required evaluation materials (e.g. business plans, details on key staff, property titles if any, construction plans if applicable) which will be evaluated by the Token Estate Marketplace staff. If the project meets the standards of the Marketplace, it goes to the next phase.
b. During the crowdfunding phase, the project will be listed on the Marketplace along with investor's evaluation materials (i.e. prospectus or equivalent, risks analysis, pictures etc...) and start collecting investors funds. During the launching phase, the TEIVs are subject to a soft cap, a hard cap and a deadline. The soft cap is the minimum amount to be raised on the Marketplace: should this amount not be reached before the deadline, the project is deemed unsuccessful and all funds returned to investors. If the amount is equal or above the soft cap, the project is successful. The hard cap is the maximum amount to be raised: if a project reaches the hard cap, it is successful and new investors are rejected even if before the deadline. RETOs are issued to investor if this phase is successful.
c. During the buildup phase, the funds collected by Tokenestate.io are released to the TEIV. The TEIV uses the funds in accordance with the pre-agreed business plan. At the end of the buildup phase, all the funds collected during the crowdfunding phase have been spent or placed in

[45] These characteristics are not applicable to Not-for-profit Token Estate Investment Vehicles as the Token Estate Marketplace might decide to wave all or parts of the requirements regular TEIVs are subjected to.

reserve. The TEIV is the owner of the underlying property which has been sold to investors in exchange for RETOs.

d. During the **active phase** the TEIV will own and manage the properties in accordance with the business plan. Potential lease revenues, capital gains (losses) are redistributed, net of TEIV operational budgets and applicable taxes, to tokenholders. If required by the TEIV management and approved by Tokenestate.io, it might conduct capital increases by 'defreezing' tokens and selling them to investors.

e. During the **unwinding phase** (if any) the TEIV will liquidate real estate holdings and use the proceeds to purchase back the tokens. At the end of the unwinding phase, no RETOs are left.

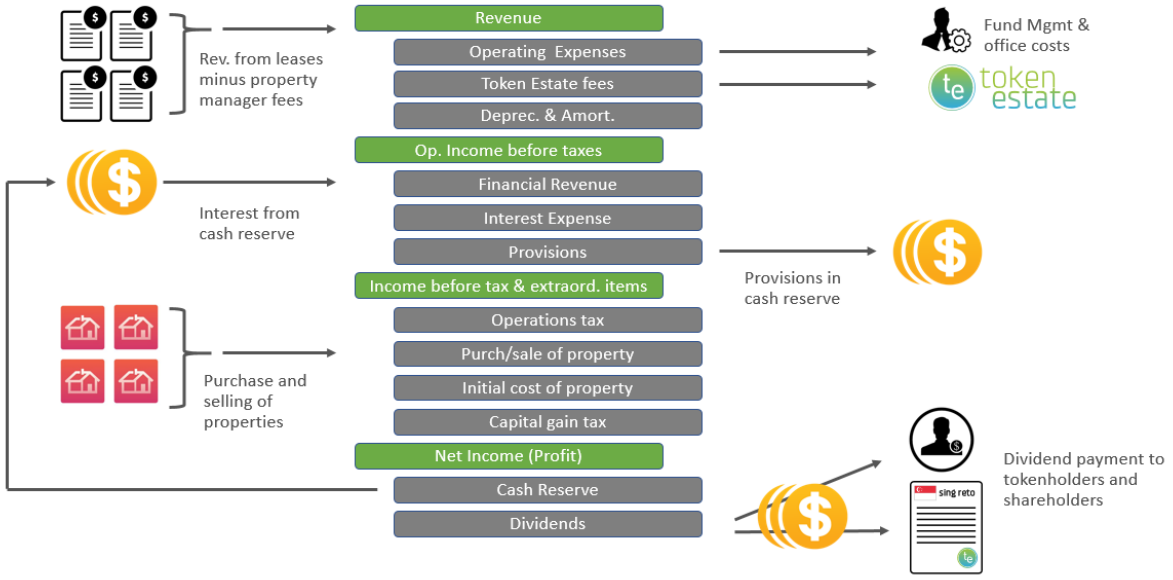

Figure 8 - TEIV Accounting Treatment

Sources of income. A TEIV will have two main sources of income: the one incurring from leases, and the one arising from capital gains on the properties under management. The former is an operational revenue and the latter a capital gain, which might be subjected to different tax treatments depending on the geographies concerned. A TEIV will maintain a cash reserve to meet unforeseen expenses and address the revenue volatility risk. If the TEIV turns out a profit, it will proceed to a payment to the shareholders and the tokenholders out of its net profit.

Payout ratio. In line with the rule applying to REITs[46], a TEIV will commit to distribute a defined percentage of its taxable earnings (i.e. the 'payout ratio') to shareholder and tokenholders. While this payout ratio is equal to 90% for REITs, it cannot be defined for TEIVs yet, as it will depend on their tax treatment by fiscal authorities in relevant geographies.

[46] As defined by the U.S. Securities and Exchange Commission, to qualify as a REIT a company must have the bulk of its assets and income connected to Real Estate investment and must distribute at least 90 percent of its taxable income to shareholders annually in the form of dividends.

Formal evaluation of property's portfolio. As frequently as required by its status, and at least once every year, the portfolio of properties owned by a TEIV will be evaluated by independent experts to establish its Net Asset Value (NAV). The result of this evaluation will be made public to all investors.

5. REAL ESTATE TOKENS (RETOS)

Novel financial instruments and regulation have underpinned economic growth over the past centuries by enabling the efficient sharing of risks and rewards between investors and entrepreneurs.

Maritime insurance for example, created in northern Italy in the 12th century, made it possible for merchants to finance commercial fleets and operate on hazardous trading routes. This spawned the maritime industry and was instrumental in Genoa and Venice becoming key trading hubs in the Middle Ages. In the 1930s, the modern mortgage was invented in the United States to bring the country out of the Great Depression, and was instrumental in helping millions across the world afford a home in the past decades.

Launching a new open standard. Our intention with the Real Estate Token (RETO) is to create a new and open standard to facilitate investing and financing real estate projects and assets. By being based on the blockchain, RETOs are more transparent and efficient financial instruments than their current 'off-chain' equivalents. Their value is essentially defined by the value of an underlying portfolio of properties owned by a legal entity: a Token Estate Investment Vehicle. Each TEIV will have its own RETO: different RETOs will correspond to different legal entities and different real estate investments.

Greater Transparency. The blockchain is an open and secured ledger, which makes it easier to share and to authenticate documents. Companies can use the blockchain to create a permanent record, via a transaction for example, of the 'thumbprint' of the documents they wish to authenticate. It is our intention to use this mechanism to associate an entire 'data room' with each of the RETOs. This data room will contain all the required information to perform a thorough due diligence on the underlying investment represented by the RETO, thereby greatly facilitating the task of market participants willing to invest in it. Conceptually, each RETO will contain the following information:

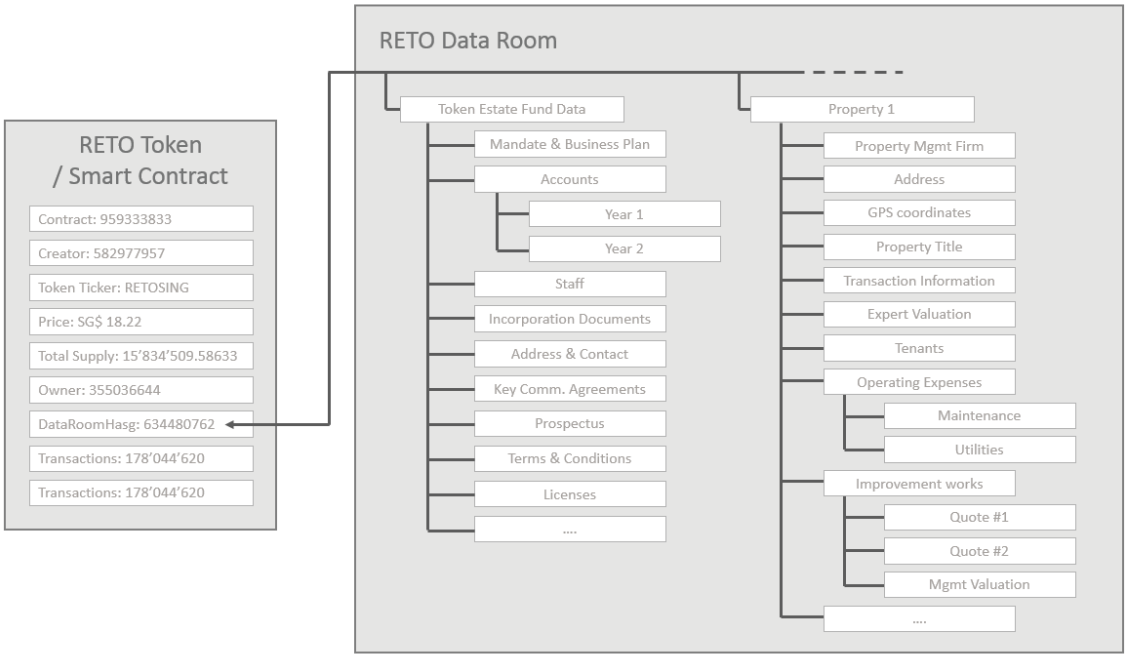

Figure 9 - RETO Data Room

Technical specifications. The RETOs are ERC-20 compatibles tokens, distributed via the Ethereum blockchain, and pursuant to related ERC-20 Smart Contracts. The code of all RETOs contracts will be open source and available for all to review, for example on the GitHub platform. The code of all RETOs is to be audited by a trusted 3rd party before launch. Each Token Estate Investment Vehicle will be linked to one Smart Contract, which in turn will generate a certain number of RETOs specific to that fund.

The number of RETOs created by a smart contract is defined at inception and cannot be subsequently changed. So, when a TEIV is launched, only a fraction of the RETOs is issued to investors. The rest are 'locked' which means that they can't trade and can't be used to receive payment from the TEIV, or to vote on the TEIV's decisions. If and when there's a need to raise new funds, to increase the TEIV's size or to finance the market making operations for example, then a fraction of these tokens is 'unlocked' and sold to investors.

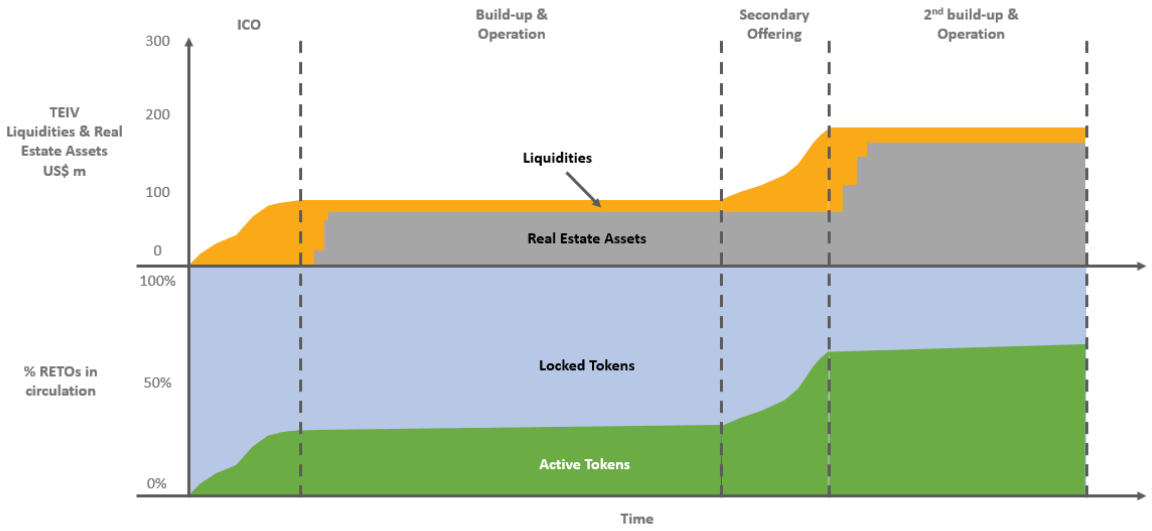

Figure 10 - TEIV liquidities vs. locked & active RETOs

Rights provided to tokenholders. Each TEIV will have its own RETO, which might be specific to its operations & legal environment. The rights granted to tokenholders will be matching the underlying legal security issued by the TEIV. For example, if a RETO represents a common share, it will entitle tokenholders with a dividend and voting right. If a RETO represents a credit note, it will entitle tokenholders to the payment of interest and principal.

Prospectuses. It is likely that each RETO will have one or several prospectuses, which will enable its sale to the public in one or several geographies, and document in detail the right granted to the tokenholders.

6. TOKENESTATE.IO

Tokenestate.io role is to protect the RETO tokenholders, being an advocate for the tokenization of real estate, launch TEIVs at scale internationally, and act as a RETO exchange. To fulfill that role, Tokenestate.io will perform the following duties:

a. Develop a compliant TEIV launching & trading Marketplace. Tokenestate.io is to be available on web and mobile, and allow investors to easily purchase RETOs and have them transferred to their Ethereum address or wallet. Tokenestate.io will make available all due-diligence information[47] to investors in a secure digital format, as well as a synthesized analysis developed

[47] Except data which contains personally identifiable information on individuals' tenants, or which otherwise is deemed to be protected by privacy laws in the concerned geographies. In such case, the Token Estate Marketplace will make such data available in an aggregated fashion.

by the Tokenestate.io staff. Tokenestate.io will maintain compliant processes and obtain authorizations from financial regulators, as required by the authorities where it is to operate.

b. Perform market-making & enforce the price convergence. Whenever required and possible, Tokenestate.io will perform market-making (i.e. ensuring there's always a market participant willing to buy or sell a predefined number of tokens) to ensure that RETOs token remain liquid. Such market-marking services will be financed, if needed, by vesting 'locked' tokens.[48] In addition, Tokenestate.io will act as a buyer of last resort should the RETO price fall below the TEIV liquidation value (cf. following section on 'Price convergence').
c. Support RETOs with data. The Tokenestate.io Marketplace will publish and maintain up-to-date all the data required to appropriately price each RETO. Investors will have access to exhaustive and up-to-date data on the various real estate assets managed by the TEIV, and on the TEIV management and operations.
d. Be the focal point of a community of real estate investors. To be successful, Tokenestate.io needs to build a thriving community of investors and real estate asset managers. Indeed, as more and more RETOs become available on the Tokenestate.io Marketplace, its will attract more and more investors. This in turn will make the Tokenestate.io Marketplace more attractive to real estate asset managers which will use it launch more and more RETOs. This 'flywheel effect' will enable Tokenestate.io to keep low operational costs and ensure the long term success of the Marketplace.
e. Source and launch Token Estate Funds internationally. Tokenestate.io will be in charge of building a pipeline of TEIVs to be launched on the Marketplace. These funds might be managed by existing real estate funds, trusts or developers, or by Tokenestate.io itself. Tokenestate.io will perform thorough due diligences on the TEIVs and partners selected for launch. Tokenestate.io will oversee crowdinvesting campaign, produce the legal material (e.g. Terms & Conditions, Prospectuses), the operations (Know Your Customer, Anti-Money Laundering), the marketing material (webpages, videos, visuals) and run the advertisement prior and during launches.
f. Be an advocate for the tokenization of real estate. It is our conviction that 'tokenizing' real estate, for example by digitizing of property titles or by allowing parties to conduct real estate transactions electronically, will be beneficial to the world's economy. Real estate tokens will make it easier for investors, especially those with no access to banks, to invest into a key wealth creation and protection instrument. More liquid real estate markets mean greater geographic mobility, by helping homeowners get a fairer price for their assets. Tokenestate.io will be a public advocate for the tokenization of real estate, and will lobby governments and international agencies to this end.
g. Protect the rights of tokenholders. Tokenestate.io will enter into legally binding agreements with Token Estate Investment Vehicles which will serve as a legal platform to enforce tokenholders' rights if need to be. The legal agreements will enable Tokenestate.io to conduct

[48] Market-making is typically financed by exchanges, through discounts provided to market-makers when they purchase or sell shares. Because RETOs are not traded on a single exchange, an alternative must be used. For the Token Estate Marketplace, the market-making activity will be financed through the vesting of 'frozen' tokens under its control.

regular audits of the TEIVs, independently establish the Net Asset Value (NAV) of their portfolio, as well as ensure that funds fulfill their data reporting obligations.

Summing up graphically the relationship between Tokenestate.io, a TEIV and its corresponding RETO:

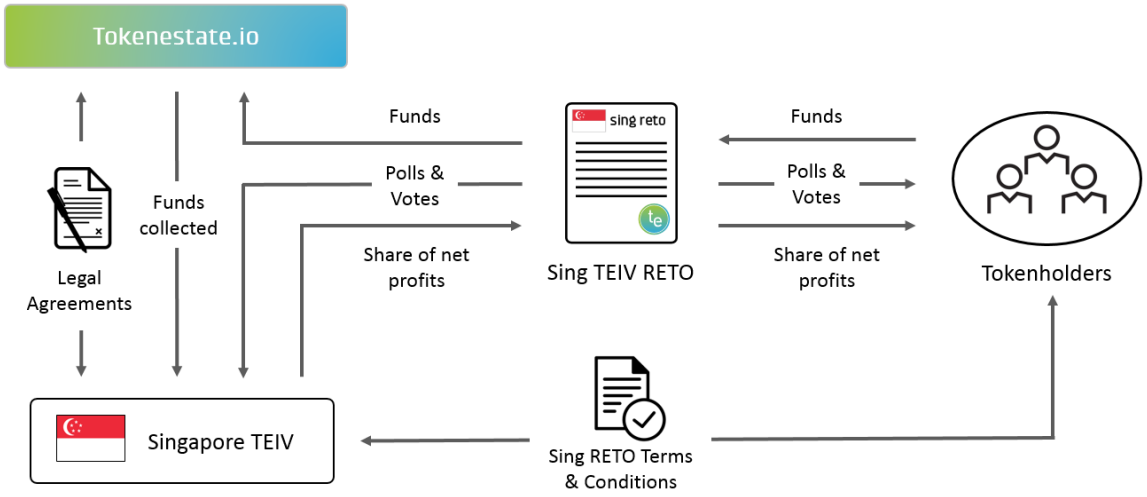

Figure 11 - RETO diagram

Price convergence. To be an effective investment vehicle, RETO values will have to converge with the future cash flows of a given portfolio of properties. Tokenestate.io will follow a two-pronged strategy to enforce price convergence:

a. Information transparency. RETOs will include by design all the required information to perform a thorough due-diligence on the underlying properties, and such information will made available to investors on the Tokenestate.io Marketplace. This will facilitate arbitrage opportunities by 3rd parties (such as hedge funds or sophisticated individual investors).
b. Buyer and seller of last resort for a limited quantity of tokens. Each TEIV will dispose of a currency reserve, and will commit to purchasing (respectively selling) a certain number of tokens should they become undervalued (respectively overvalued). The purchasing will be performed by Tokenestate.io on behalf of the TEIV. The purchased tokens will be 'locked'. The TEIV will sell assets corresponding to the amount of 'locked' tokens to replenish its cash reserve. This will result in the TEIV organically shrink in size.[49]

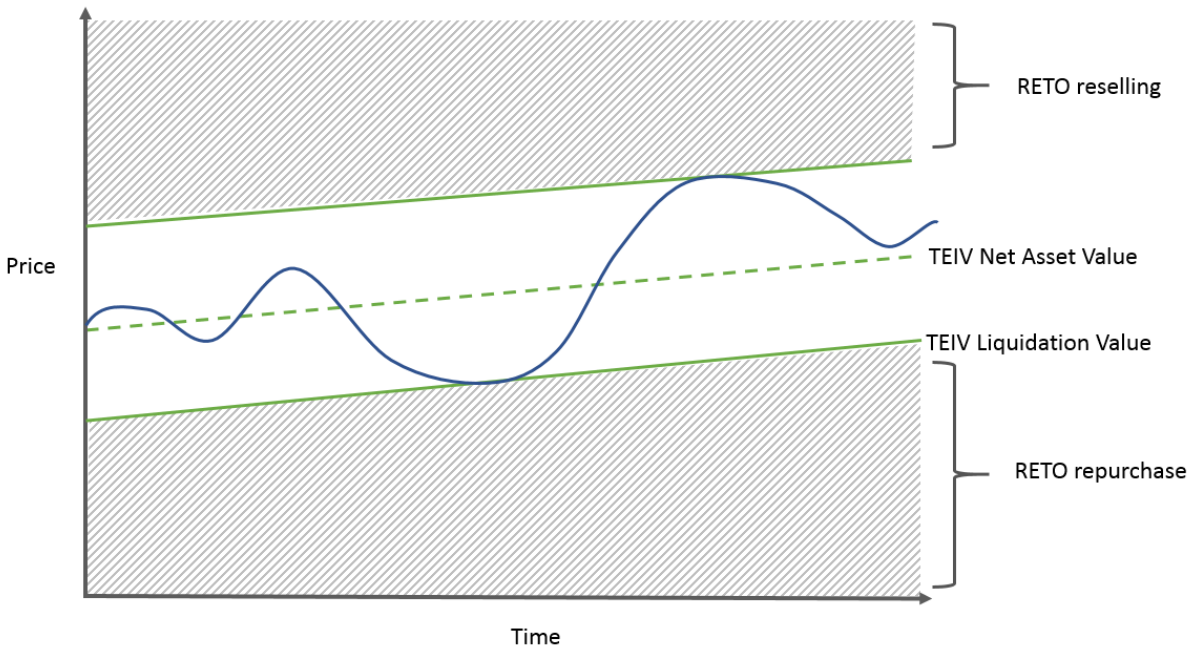

Figure 12 – Tokenestate.io interventions

Sources of income. Tokenestate.io income will accrue from services provided to TEIVs, such as:

a. Launching services, amounting to 0 to 5% of the funds raised, if projects are successful.
b. Performance fees on the TEIVs, accruing to 0 to 10% of the gross profit, if any.

Payouts to shareholders and TEM tokenholders. The TEM tokenholders will be collectively entitled to a payout issued from the profits of Tokenestate.io equivalent to a multiple of the dividend paid to the Tokenestate.io shareholders.

From Switzerland. Tokenestate.io was initiated by a highly qualified team of Swiss-based technology, real-estate, finance and legal professionals. Switzerland is neutral, stable and widely recognized as a leading business destination, being ranked for the 9th consecutive year as the world's most competitive economy according to the World Economic Forum (WEF).

Regarding investor protection, Switzerland has entered into over 120 Bilateral Investment Promotion and Protection Agreements, which afford international law protection for investment made by Swiss companies[50]. A recognized financial center, the country is home to highly skilled technology, financial and investment professionals with international experience. Crucially, and as detailed above, it is one of the most blockchain-friendly jurisdictions in the world.

For these reasons, it is Tokenestate.io management's intention to keep Switzerland as its main place of business, should it be legally and economically practicable to do so. However, Tokenestate.io management team might choose, at its own discretion and at any time in the future, to establish its

[50] Swiss Secretariat for Economic Affairs - Switzerland's Investment Treaty Policy – April 20, 2016

main office or part of its operations in a different country should this be required to serve the business objectives of the company.

International Expansion. To better serve real estate investors, and realize economies of scale, Tokenestate.io will intend to operate in a variety of geographies. We're currently assessing the following geographies: Switzerland, members of the European Economic Area, Gibraltar, the United Kingdom, Dubai, Singapore, Japan, certain states in the United States of America, China or one of the Chinese Special Administrative Regions. Tokenestate.io will use parts of the Pre-Sale proceeds to finance such international expansion and to hire talents in selected geographies.

7. TEM TOKENS

General description. To finance its development and operations, the Tokenestate.io will issue its own token, the TEM token, which is a Participation Certificate[51] (*bons de participation / Partizipationsscheine*) as defined in the Article 656a of the Swiss Code des Obligations.[52] By purchasing TEM tokens, investors will have profit sharing rights in Tokenestate SA, a company incorporated in the canton of Neuchâtel, in Switzerland.[53]

Swiss Prospectus. The rights granted to TEM tokenholders will be defined in a Swiss Prospectus, to be released to whitelisted investors at a future date. The prospectus will also detail the price of the tokens, and applicable discounts to early investors.

Technicalities. The TEM tokens to be issued are Ethereum ERC-20 compatible. They are to be audited by a trusted 3rd party, and their code & documentation will be available for investor to review on the GitHub platform.

8. REAL ESTATE STRATEGY

Tokenestate.io will carefully vet every RETO to be launched on its Marketplace. In this section, we summarize our real estate investment philosophy.

Key investment drivers. Real estate profitability drivers are well-known: location, attractivity, net revenue, debt leverage, credit ratings of the tenants, market conditions, predictability of cash flows, urbanistic constraints, taxes, durability, and physical condition of the assets. Obviously, having experience in correctly assessing these drivers, putting them in global macroeconomic context and negotiating transactions are key enablers to realize profits.

[51] Participation Certificates are the equivalent of non-voting shares
[52] https://www.admin.ch/opc/fr/classified-compilation/19110009/201407010000/220.pdf
[53] https://www.zefix.admin.ch/fr/search/entity/list/firm/1348396?name=token&searchType=exact

Real estate management. Operating the respective assets requires local knowledge, technical know-how, legal competencies, dedicated resources and time to maintain the financial, technical and administrative conditions. The good property manager will focus in improving profitability drivers over time to enhance revenues and capital gains. Our experienced team will seek to secure performance by enforcing a professional approach on all sides of the business: transaction, portfolio, data and property management.

Real estate investment categories. Tokenestate.io will focus on Residential and Commercial real estate which are defined as:

- Residential real estate refers to single and multi-family homes, apartments, townhouses, condominiums and vacation homes.

- Commercial real estate refers to office buildings, industrial buildings, retail and restaurants assets from single shops to shopping malls, certain types of apartment complexes or high-rise apartment buildings, medical and educational buildings, hotels and entertainment facilities.

Although every investment opportunity is unique, one commonly considers map investment opportunities into the following groups, depending on their inherent balance of risks and potential return: trophy, core, core-plus, value added, or opportunistic.

- Core properties tend to generate highly predictable cash flows. These properties are typically stable, fully leased on long-term leases by credit worthy multi-tenants and located within strong, diversified, thriving metropolitan areas. The properties are typically fully stabilized and require little to no improvements. Core properties tend to be low-risk low-potential investments.

- Core-plus real estate is like core, but not quite as high quality. It might be in the suburbs, within a secondary metropolitan area or could require some form of value add enhancement. The tenants may not have solid rent guarantees. The property type might be riskier, such as self-storage, entertainment, medical offices, or student housing. They present a moderate-risk moderate-return investment profile.

- Value-Added real estate investments typically target properties that have in-place cash flow, but seek to increase it over time by making improvements to or repositioning the property. This could include making physical improvements to the asset that will allow it to command higher rents, increasing efforts to lease vacant space at the property to quality tenants, or improving the management of the property. The planned strategy can take years to execute, therefore awareness of the real estate cycle and timing are crucial. Medium to high leverage is used to finance those projects that offer in-place cash flow. This is a medium-to-high-risk medium-to-high-return strategy.

- Opportunistic & development real estate investments follow the value-added approach but take it a step further on the risk spectrum. The investors take an entrepreneurial risk to achieve out-sized returns. There are numerous types of asset investments that fall into this category, including ground-up developments, significant rehabilitation, adaptive re-use, emerging

markets, mortgage notes, and niche property sectors. Timing is crucially important as these projects typically require the use of high leverage and are often subject to less favorable debt terms and higher interest rates than more stabilized properties. This is a high risk high return strategy.

- Distressed properties are assets perceived as being out of favor by their owners or by other investors. This investment type usually involves high maintenance as the properties may have been abandoned by their previous owner, or not kept up maintenance-wise. Buying heavily distressed assets and refurbishing them can be a very profitable activity: buy low, sell high. Two big challenges in distressed properties are that many sellers can't wait for buyers to obtain a loan, and many lenders don't like lending on such assets. Timing is crucial. This is a high risk high return strategy.

- Trophy or iconic. this segment represents a thin slice of the market figuring the most distinctive buildings or streets in the world, which became brands in their own right. These assets will always command a premium to other top-grade property. Tenants want to remain in this type of buildings, as they want their respective images to be associated with the location. The value-retaining qualities of trophy buildings have positioned them among a small number of haven investments within the property sector. In London, Paris, Hong Kong, New York and Rome, real estate investors are willing to pay a premium for those rare buildings that are likely to float above any economic turndowns. Trophy or iconic are sought after as they guarantee their owner good value preservations over time, and tend to be anti-cyclical.

Real estate geographies and strategy to be defined by the Tokenestate.io community. Tokenestate.io does not limit by design the geographies where it intends to ultimately operate. However, the geographies where Tokenestate.io will launch its initial TEIVs will ultimately be driven by the investment objectives of the Tokenestate.io community, by regulation and by local market conditions.

For example, it might be possible that investors be willing to use Tokenestate.io to invest in markets where they typically do not have access, or show a certain level of risk appetite. We intend to conduct polls with our investor community to orient our choices in certain geographies or types of assets.

Tokenestate.io is considering launching RETOs corresponding to the following metropolitan areas:

Figure 13 – RETO Metropolitan areas

1. OFFICIAL COMMUNICATION CHANNELS

Website: www.tokenestate.io

Telegram: www.t.me/tokenestate

LinkedIn: www.linkedin.com/company/tokenestate.io/

Facebook: www.fb.me/tokenestate.io

Medium: www.medium.com/token-estate

Slack: www.tokenestate.slack.com

Twitter: @token_estate

2. ACKNOWLEDGEMENTS

We would like to express our gratitude to the people and businesses who supported us in conceiving Tokenestate.io.

Special thanks to Iris Gaudras from ggba-switzerland.ch, Antonio Gambardella from FONGIT.ch, Kazunori Ozawa & Guillaume Houlier from Details.ch, Matthieu Robin from Hidora.ch, Alexandre de Boccard and Fabien Gillioz from Ochsner & Associés, Sal Matteis from FintechFusion.ch.

Your support has been instrumental in making Tokenestate.io a reality. Thank you.

hello@tokenestate.io