NEWTOWN PARTNERS

BLOCKCHAIN INVESTMENT & ADVISORY

SECURITY TOKENS
A PRIMER

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Table of Contents

EXECUTIVE SUMMARY

Security Token Offerings (STOs) are a novel fundraising mechanism birthed from increased regulatory oversight on Initial Coin Offerings (ICOs). This document provides: an overview of the problems Security Tokens are attempting to address; an overview of the Security Token ecosystem; select geographies and their developing regulations; a brief breakdown of the Security Token stack; a rough timeline of the STO process; concerns and caveats around Security Tokens and an appendix of select Security Token case studies.

Given that the certainty provided by regulated instruments and their associated rights is a large short-term attraction for investors, Newtown Partners believes STOs will be the preferred capital raising avenue for startups in the blockchain space within the next 12 - 18 months. The majority of these offerings will be structured as a SAFT-E (likely to be favored by investors given the flexibility it provides); with Malta, Gibraltar and Singapore providing acceptable regulatory frameworks to do so.

STOs hold contractually-bound, legally-enforceable obligations backed by the might of the law which will provide a certain degree of comfort for investors who will invest in this space given the familiarity with these policies and structures; however, this comfort does come at the price of increased disclosure requirements.

Finally, Security Tokens will not replace utility tokens in providing core functionality to decentralized protocols. This is primarily because of the large regulatory burden associated with STOs, and thus they are not viable replacements to utility tokens in a decentralized network. However, given their viability as fundraising mechanisms, STOs will be used in bootstrapping the construction of these decentralized protocols (protocols which would be powered by utility tokens); or exist in symbiosis with a utility token in a dual-token architecture.

DISCLAIMER

1. Background

Security Tokens, otherwise known as Digital Securities, Programmable Securities, Smart Securities or Cryptosecurities, are regulated financial securities offered to investors through a Security Token Offering (commonly known as STOs) or Digital Security Offering (DSOs). Thus, these must comply with jurisdictional financial regulations. These 2nd Generation tokens provide an array of different financial rights to an investor such as equity, dividends, profit share rights, voting rights, buy-back rights, etc. Often these tokens represent a right to an underlying asset such as a pool of real estate, cash flow, or holdings in another fund. These rights are written into a smart contract and the tokens are traded on a regulated blockchain-powered exchange.
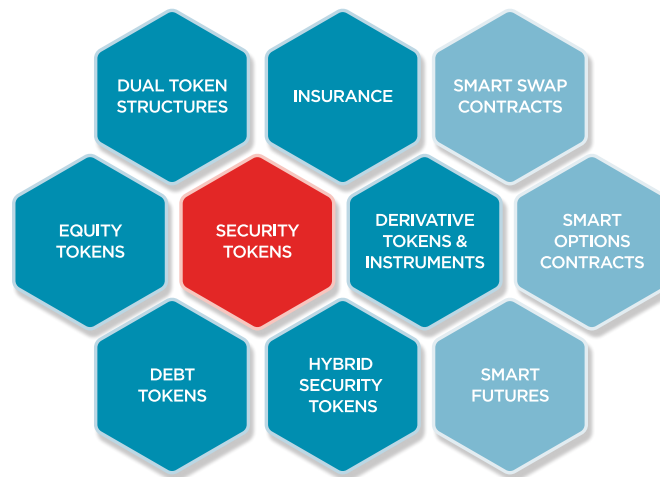

Figure 1. *Non-hierarchical overview of financial products enabled by the embedded logic in Security Tokens [1]*

Another mental framework one can adopt is: if cryptoassets (e.g. Bitcoin, Z-Cash) are visualized as "programmable money" then Security Tokens are "programmable ownership." [2] Essentially, assets which exhibit ownership characteristics and have the potential to be tokenized (public and private equities, debt, real estate, etc).

The premise of the emerging Security Token ecosystem lies in combining the traditional regulatory framework for securities with the core efficiencies of the blockchain (particularly automation, interoperability and finality). This progression has broadly followed 3 narratives since inception:

→ *Efficiency improvements to the current (public) financial market infrastructure*

→ *Enabling and democratizing the long-tail of (private) financial markets*

→ *Monetizing previously unrealized assets*

The premise continues that all stakeholders will benefit from a restructuring of the capital markets status quo, towards an architecture built across (and on) distributed ledger technology. The benefit of different stakeholders compared to the status quo is as follows:

→ ***Issuers*** *benefit from the lower cost of capital and compliance*

→ ***Investors*** *benefit from improved market depth (through a wider investor base) and therefore broader liquidity*

→ ***Regulators*** *benefit from improved visibility and enforceability*

As regulatory controls have begun to tighten around fundraising blockchain projects through utility tokens that are not fundamental to the functioning of the project, alternative avenues that lower regulatory risk are being explored. Security Tokens have therefore found favor with institutional investors for their recognizable structure, and with blockchain investors for their technological innovations (and potential applications).

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1 - Adapted from <u>Security Tokens: A General Understanding</u> - Joel Camacho (Jun-18)
2 - <u>The Official Guide To Tokenized Securities</u> - Anthony Pompliano (Feb-18)

2. Evolution of the Narrative Around Security Tokens

Narratives have inevitably been shaped around the developments in the Security Token landscape; developments which have been rapid and within the purview of regulatory bodies. Subsequently to the 'ICO-mania' period, Security Tokens have increasingly been at the intersection of blockchain technology, regulatory compliance and the financial sector.

The table below summarizes these high-level narratives that have persisted over time, including some emerging narratives:

TABLE 1 - NARRATIVES SURROUNDING SECURITY TOKENS OVER TIME

NARRATIVE THEME	DESCRIPTION
"ICOs"	→ Fundraising through ICOs main avenue without regulatory oversight → Narrative revolved around whether ICOs would be considered securities (largely by the SEC, as a global regulatory bellwether) → Notion of legally compliant token sales (or Security Token Offerings) began taking shape as regulatory authorities began investigating ICOs
"Fund and Asset Tokenization"	→ Discourse shifted towards tokenizing VC and/or private equity funds to provide liquidity to their LPs that would normally have their capital tied up for 7 to 10 years → Tokenization of unrealized value of assets (namely art and real estate) also began taking shape → Financial products in blockchain wrappers (following primitives of trust, interoperability and completeness) started being proposed

"STOs as a Fundraising Mechanism"	→ Status quo narrative centers around blockchain companies issuing security tokens to raise capital versus issuing Utility Tokens
	→ Utility Tokens will still play a part in the core functionality of decentralized networks, namely as companies move further towards decentralization (or have aspects thereof)
	→ Newtown Partners believes that more companies will look to raise capital through Security Tokens, whether that be through equity or debt token structures (in a broad sense). This will primarily include:
	  → Blockchain-focused companies who do not sit at the extreme end on the spectrum of decentralization
	  → The long-tail of companies and assets seeking access to a wider capital base

New, Evolving Narratives	→ Interoperability a fundamental tenet for the future success of Security Tokens
	  → Evidenced through increased attention given to dual-token structures and debt- and equity-linked token proposals (e.g. Two Token Waterfall)
	→ "Build it and they will come" mentality with regards to the infrastructure allowing STOs
	→ Despite the promise of liquidity not entirely proven
	→ "Open Finance" will allow individuals and blockchain firms to provide financial products previously in the remit of large financial institutions and investment banks
	→ Decentralized Finance the catalyst for financial technologies to leapfrog current outdated infrastructure [3]
	→ Critical lack of infrastructure in areas such as compliance and disclosure requirements coming to the forefront of the conversation
	  → Catch-22 where infrastructure is required for the adoption of Security Tokens, while the adoption of Security Tokens could push for more stringent disclosure and compliance requirements by the long- to mid-tail of businesses

EVOLUTION OF NARRATIVE OVER TIME

3 - A Crypto Thesis - Pantera Capital (Jan-19)

3. The Problems Security Tokens Are Trying to Solve
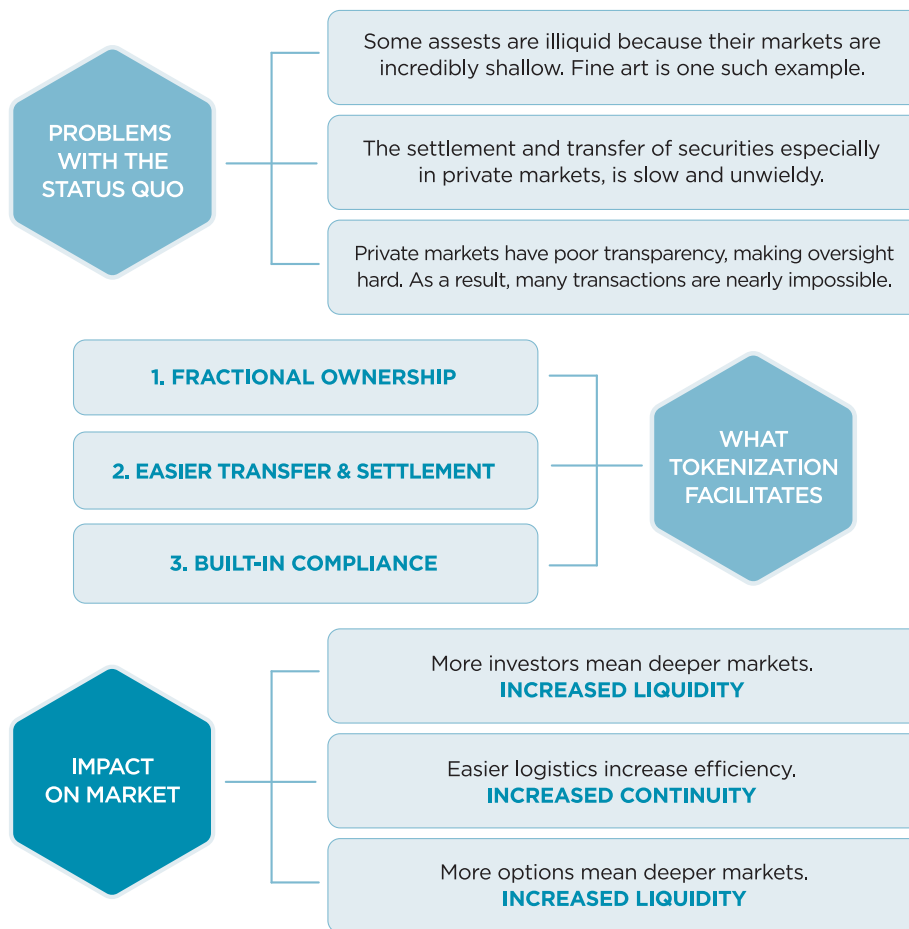
Figure 3. *High-level overview of Security Token solution space* [4]

"Financial innovation is always and in all ways one of two things—a new way of securitizing something or a new way of leveraging something…Securitization is a ten-dollar word that means associating something in the real world with a piece of paper that can be bought and sold separately from that real-world thing" **- Ben Hunt, Epsilon Theory, 2018** [5]

STOs are largely not technical innovations, but rather focus on incremental efficiency gains in capital markets by removing middlemen, rapid settlement and automated service functions.

These are non-trivial problems in the financial markets universe, and the incremental gains to even one facet of the purported benefits of utilizing STOs could be highly compelling to both issuers and investors. A consolidation of the core benefits (and parallel concerns) surrounding Security Tokens are tabled below; however Chris Burniske poignantly describes the true innovation of cryptoassets (and by inference, Security Tokens) as such:

"Regardless of what we call it, the important thing is that the "consensus system" remains, providing a decentralized way for (rational) economic actors to reconcile the truth. The economic incentives that induce actors to perform this function without a central coordinator is the true innovation." **- Chris Burniske, 2018** [6]

TABLE 2 - OVERVIEW OF THE PROBLEMS SECURITY TOKENS ARE TRYING TO ADDRESS

BENEFIT	COMMENTARY	CONCERNS
Innovation	→ Creation of financial products the largely in the purview of siloed financial institutions → Digital or Smart Securities with open, programmable, embedded logic could allow for an explosion of financial innovation	→ Financial products will still require regulatory oversight → Critical infrastructure will need to be built out to support accelerated innovation → Administration (i.e. compliance and disclosure requirements) will need to improve to support technical progress
Liquidity	→ Globally Integrated Markets → Wider Investor Base → Removal of Friction → Fractional Asset Ownership	→ Liquidity Follows Value: small micro-cap assets will not have liquid markets → Market makers will be required → Premise of retail investors purchasing an extremely wide offering of assets at scale is not proven yet
Asset Interoperability	→ Incompatibility between classes increases transfer friction, and decreases malleability → Blockchain provides open standards to build upon, allowing the creation of an efficient financial market infrastructure → Parallels can be drawn to the creation of open web standards enabling web innovation	→ Incorrect approach to developing interoperable token standards will yield siloed systems (and a return to the current paradigm)
Automated Compliance	→ Favorable for issuers (ease of use) and regulators (ease of monitoring) → Assist investors and issuers in navigating cross-border and cross-asset regulatory requirements → Efficiency (and presumably liquidity) gains through the removal of compliance reconciliations (as the contracting environment can be hardwired into the token architecture)	→ Additional disclosure requirements could outweigh cost savings → Administrative burden
Rapid Settlement	→ Transform the service provider function (lawyers, bankers, agents) into more advisory functions → Mitigating counterparty and other risks → Lowers margin requirements for clearing agency members → Reduce pro-cyclical margin and liquidity demands (especially during periods of market volatility)	→ Front-running trades (although this can be mitigated through implementing zero-knowledge proofs and capped gas limits) → Recoverability of tokenized stock with regards to failed trades → 'Paper' transfer of ownership in the real-world will still require time, even if rapid settlement is possible
Cost Reduction	→ Various layers in financial transactions to reach settlement are costly → Automation through smart contract finality should abstract these costs away	→ Potential for increased wash trading activity (given lower costs) in order to boost volumes, however automated compliance and easier regulatory oversight should mitigate this → Adding blockchain wrapper to financial products does not guarantee cost reductions
Fractional Ownership	→ Improves accessibility to assets encumbered by high unit costs (e.g. Art, Real Estate) → Wider syndication to a pool of investors can lower the cost of capital for issuers	→ Tragedy of the Anticommons [7] → Transferability of ownership rights and actual ownership of asset not clear (at 51% stake for example) → Separation of ownership rights to cash flow generative assets (i.e. property) vs. non-cash flow generative assets (i.e. art) → Currently possible (i.e. not blockchain-native) but has not seen wide usage
Record of Ownership	→ Global share settlement and ledgers are subjected to reconciliation practices [8] which obfuscate (and create lag in) the record of company ownership	→ Open disclosure of ownership is not always desirable, but zero-knowledge proofs and Shamir's Secret Sharing encryption will have a role to play here
Mitigating Manipulation	→ Open and real-time verifiable securities ledger should usher behavioral best practices → Prevents naked short selling	→ Oracle problem will not be solved by putting securities on the blockchain
Always-Open Markets	→ Although not truly transformational, will remove the need for aftermarket trading reconciliation	→ Increased indirect costs [9] → Technically possible currently → Coordinating attention/activity within specific hours increases liquidity

7 - Tragedy of the Anticommons - Alpen Sheth (Nov-18)
8 - How Global Ledgers & Settlement Work - Bruce Fenton (Sep-18)
9 - Liquidity Externalities and Adverse Selection: Evidence from Trading after Hours - Michael Barclay, Terrence Hendershott (Mar-04)

4. The Security Token Market Landscape

4.1 Select Geographies & Regulations

Table 3 - Overview of relevant regulations in the USA

While not necessarily a friendly environment for STOs, there is certainly effective guidance and open discussion throughout regulatory developments in the space

LAW/REGULATION	DESCRIPTION	PROS	CONS
Regulation A+	Allows companies to issue a security to non-accredited investors for a total amount of up to $50m. Due to the expense and difficulty to qualify, very few companies have attempted this route, with no STO having been qualified by the SEC.	→ Opportunity to raise a large amount of capital → No resale restrictions	→ Issuers must qualify their offering with the SEC → All money raised treated as revenue and taxed as such → Ongoing reporting obligations. → A company meeting the definition of an investment company cannot qualify
Regulation D	Allows offerings to avoid SEC registration given that they only sell to accredited investors. Arguably the most appealing of the regulations. Over the course of Jan. 2017 - Jan. 2018, 83 ICOs were initiated via Form Ds.	→ Opportunity to raise a large amount of capital → No requirement to be registered with the SEC	→ Token security trade only allowed among accredited investors → Resale restrictions → Non-existent voting and management rights → No rights to distributions and/or ownership of equity
Regulation Crowdfunding (CF)	Popular among startups looking to raise seed capital from unaccredited investors. Possible application for STOs but not utilized as of yet.	→ Simple to implement. → Unaccredited investors may participate	→ Limited to small amount of capital - $1.07m → Company must be domiciled in the US → No investor can transfer the securities for 12 months. → Transfer restrictions
Regulation S	Applies to companies based outside the US and means that companies are not subject to the registration requirement under the Securities Act of 1933.	→ Allows companies to avoid SEC registration and avoid US regulations	→ No 'direct selling efforts' of the security are permitted in the US. → Difficult to balance the nature of decentralized blockchain technology and complying with the regulation
JOBS Act (2012)	Enacted to help businesses raise capital without having to go through costly IPOs. While not specifically aimed towards Security Tokens, they benefit from this regulation.	→ N/A	→ N/A
Delaware Senate Bill 69 (Similar bills are being assessed in Vermont, Arizona, Nevada and Wyoming)	Allows the use of blockchain technology among companies' sensitive records.	→ Corporations may use blockchain technology to maintain stock ledgers, corporate records and to transmit notices to stockholders	→ Law only applies to firms based in Delaware

Table 4 - Overview of the stance of various countries towards blockchain technology - Rest of the World

Between countries there is substantial variation in the attitudes towards regulatory approaches. Below is a list of the major markets.

COUNTRY	STANCE TOWARDS BLOCKCHAIN	ADDITIONAL INFORMATION
China	All activity banned	→ Cryptocurrency activity banned in January 2018
South Korea	Strictly regulated	→ Cryptocurrency exchange regulations are strict, with a ban prohibiting trading
Singapore	Friendly	→ Token securities treated like conventional securities → No token offering has yet been approved by their regulatory body
Hong Kong	Friendly	→ Token securities treated like conventional securities
Japan	Friendly	→ Payments Services Act recognizes digital currencies as legal tender → Gains on cryptocurrencies categorized as miscellaneous income → Financial Services Agency requires crypto exchanges to be registered → More regulatory reform has been touted
Australia	Friendly	→ Focusing on developing a regulatory framework suited to cryptoassets → According to ASIC, the laws applicable to cryptoassets or ICOs depend on whether it is a financial product, as defined in the Corporations Act
EU	Friendly	→ Art. 4(1)(44) of the Directive on Markets in Financial Instruments (MiFiD 2) relevant securities law legislation → According to MiFiD 2, a token is considered a security if it is transferable, negotiable and standardized. This means that determination of a transferable token security depends on the transfer of units in the secondary market rather than on the investment character of the instrument [10] → Major difference between US is that non-transferable tokens would not qualify as securities (otherwise, largely similar environment to the US) → EU regulations apply regardless of where the issuer domiciles
United Kingdom	Friendly	→ Brexit has caused uncertainty with respect to its regulatory environment. It is still unclear how the UK will be affected and what regulatory plans it has. The UK is a signatory to the EU Blockchain Observatory Forum which has given it access to the EU's fintech market. It is uncertain how the country's removal from the EU will impact it and Gibraltar's position as a fintech hub → The UK's FCA has launched a global fintech regulatory sandbox that allows for innovative fintech development without requiring a full, strict regulatory process for testing. 90% of companies, which includes blockchain related companies, have gone on to market [11]. The idea is to create global regulatory standards for fintech
Gibraltar	Very friendly	→ Well-defined blockchain-specific regulatory framework in place - Distributed Ledger Technology Providers Regulation (DLT) → As a British Overseas Territory, Gibraltar is vulnerable to Brexit and requires the disclosure of information on beneficial owners. → Low taxation environment
Malta	Very friendly	→ Most cryptocurrency trading volumes now happen on platforms registered in Malta [12] → So far there is a well-defined and comprehensive outline of what innovative legislation the Maltese government wants, but as of yet there has been no concrete action
Bermuda	Very friendly	→ Move towards becoming blockchain friendly came later than Gibraltar and Malta → The Banking Act has been updated to ease local banks' concerns about regulatory issues

10 - Initial Coin Offerings: Are Tokens Securities under EU Law? - University of Oxford (Sep-18)
11 - FCA reveals the fourth round of successful firms in its regulatory sandbox - UK Financial Conduct Authority (Jul-18)
12 - Most Cryptocurrency Is Moving To Malta, At Least Legally - Bloomberg (Aug-18)

A summary of the regulatory climates and developments per region is found below:

US & European Union Region: The US and the EU are notable regions with regards to regulatory developments around cryptoassets, particularly the various technology hubs contained within these regions. The differences between the two regions are minor. However if the token is not transferable it would not be classified as a security in the EU while in the US it would be.

Asia: The Asian region is also steadily rising in prominence, where Hong Kong and Singapore are gaining momentum in becoming attractive listing destinations given progressive attitudes towards regulatory reform.

'Blockchain Friendly' Regions: Bermuda's impetus to be more blockchain friendly has come about later than the rise of Gibraltar and Malta as cryptoasset havens (from a regulatory standpoint). The Banking Act in Bermuda has been updated to ease local banks' concerns about regulatory issues. Malta and Gibraltar have consistently pursued being viewed as cryptoasset havens, with smaller island nations (Cook Islands, Seychelles, Mauritius etc.) following suit in order to attract investments and regulatory arbitrage. A number of blockchain firms have translocated their regulatory status to more friendly jurisdictions, and this regulatory arbitrage is likely to continue, thereby forcing the hand of laggard jurisdictions into providing clarity on their positions.

4.2 Security Token Ecosystem

The information and diagrams below attempt to paint a picture of the various participants and verticals within the Security Token ecosystem.

Figure 3. *Overview of the relevant, and notable, current participants in the Security Token ecosystem* [13]

13 - **Mapping Out The Security Token Ecosystem** - The Block (Nov-18)

Figure 3. *Overview of the relevant, and notable, current participants in the Security Token ecosystem*

To note: A number of entities, such as SeedInvest and Banktothefuture, are also liquidity providers which are not separately shown here.

Partnership Landscape.

This Business Social Graph lets you visualize the partner relationships between ST Primary Issuance Platforms and other ST ecosystem participants.
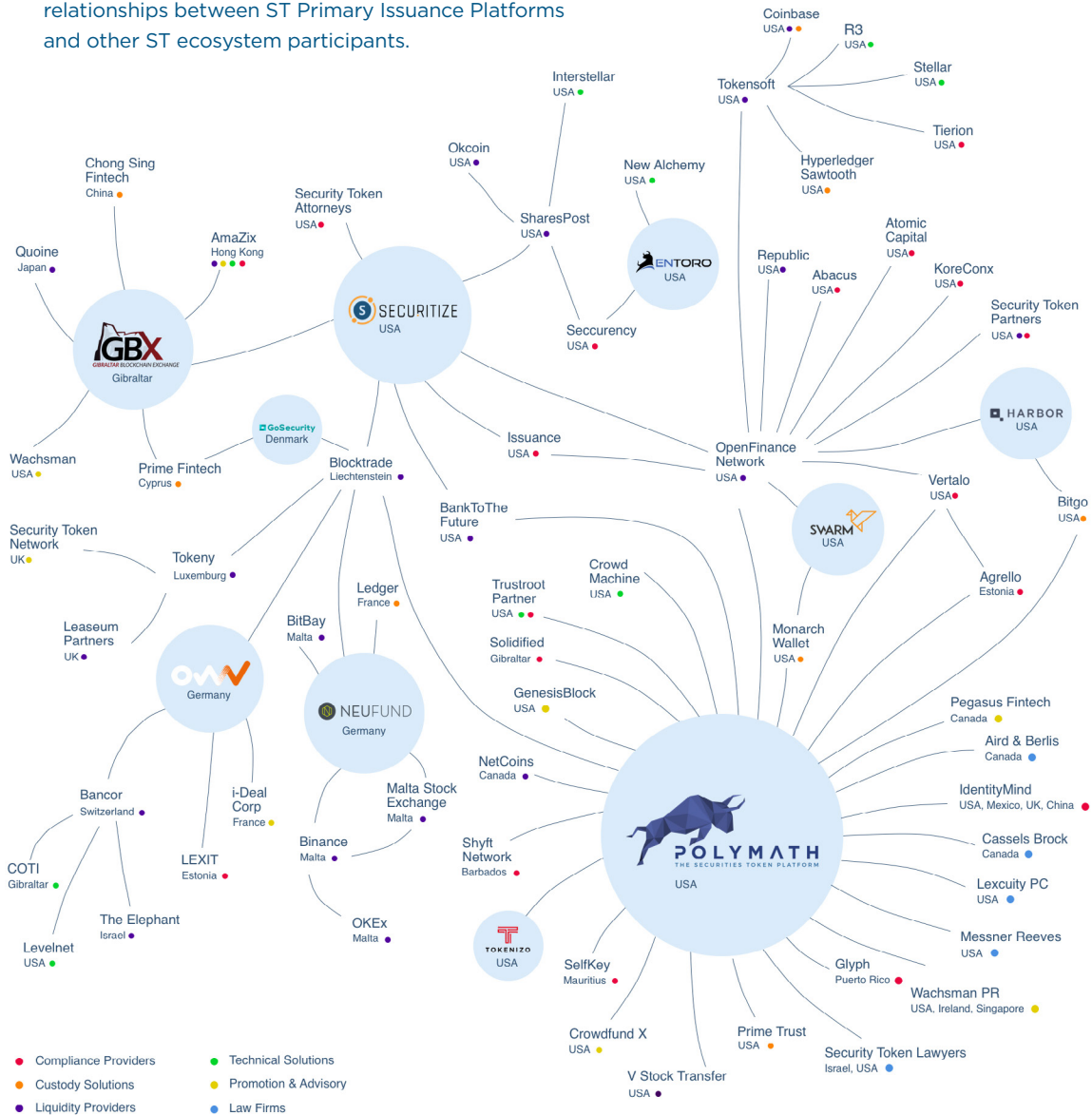

Figure 4. *Overview of the Partnerships in the Security Token landscape* [14]

14 - <u>Digital Securities Market Research 2019</u> - Kepler Finance (Jan-19)

TABLE 5 - OVERVIEW OF VERTICALS IN THE SECURITY TOKEN ECOSYSTEM

PLATFORM	DESCRIPTION	SELECT EXAMPLES
Token Exchanges	Platforms falling under this category serve to create secondary markets for Security Tokens. Along with a trading platform, typical functions include brokerage, stock inventory management systems, clearing and settlement. Exchanges can be centralized (e.g. tZero, OpenFinance) or decentralized (e.g. Airswap), depending on market need	➔ Bancor (TBC) ➔ Sharespost ➔ tZero ➔ Airswap ➔ OpenFinance Network ➔ Ambisafe/Orderbook ➔ TokenMarket
Broker Dealer	These platforms primarily focus on providing brokerage services for large investors.	➔ Coinbase ➔ Propellr ➔ Tokenmarket (TBC) ➔ Templum
Issuance	Issuance platforms typically provide a protocol for entities looking to launch their own STO. The protocol usually encompasses compliance to KYC/AML, accredited investor checks, holding periods, investor limits, security requirements among others. The aim is to ensure that the Security Tokens that are launched comply with the relevant security laws and regulations.	➔ Harbor ➔ Polymath ➔ Platinum ➔ Swarm ➔ Indiegogo ➔ Securitize
Hybrid Platforms	These 'hybrid' platforms offer both token issuance and secondary market trading services.	➔ Palladium ➔ Securrency ➔ Element Group
Incumbent Stock Exchanges	Certain stock exchanges have been gearing themselves to dealing in Security Tokens. They may not have the same level of expertise and freedom from regulation as the exchange platforms like OpenFinanceNetwork and tZero, they have the significant advantages of being well-trusted and better exposure to trading volumes. The following are a snapshot of the more progressive stock exchanges.	➔ Gibraltar Stock Exchange (GSX) ➔ Australian Stock Exchange (ASX) ➔ Malta Stock Exchange (MSX) ➔ Swiss Exchange (SIX)
Ancillary Projects / Compliance	These companies provide services that support the functioning of the market. Services include asset transfer security and verification, legal support, anti-money laundering and KYC among others.	➔ Ravencoin ➔ Lowenstein Sandler ➔ IdentityMind ➔ Vertalo
To Be Built / In Production	Disclosure requirements for companies issuing Security Tokens. Regulation will need to be instituted, although this should likely be a matter of time. Derivative products have largely only been proposed, with some in production (Section 5.4)	➔ Derivatives ➔ Disclosures Requirements ➔ Equity Research

4.3   Fundraising Via STOs Thus Far

While Security Tokens are a very new financial instrument, there are a handful that have been launched by the following ambitious firms. The information below attempts to summarize the most relevant STOs which have been conducted thus far.

TABLE 6 - OVERVIEW OF SELECT STOS BASED ON RECENCY AND SIZE

TOKENIZED SECURITY	AMOUNT RAISED / AUM	BRIEF DESCRIPTION
Blockchain Capital	$10m	→ First to introduce a public offering for a securitized token. Aim is to allow token holders into the venture capital market when previously they couldn't access it → Issued by Securitize → Issuing under Rule 506(c) of Reg D
Science Blockchain	$13m	→ Company selects promising blockchain startups into their portfolio. Token holders own shares in the fund → Issued by Securitize → Issuing under Rule 506(c) of Reg D
SPiCE VC	$15.5m	→ Similar business model to Science Blockchain → Issued by Securitize → Issuing under Rule 506(c) of Reg D
22x	$5m	→ Tokenized fund (as per SPiCE VC and Science) → Issued by Securitize → Issuing under Rule 506(c) of Reg D
Augmate	$12m	→ Wearable IoT technology company → Issued by Securitize → Issuing under Rule 506(c) of Reg D
Lottery.com	$52m	→ Gambling and lottery platform → Issued by Securitize → Issuing under Rule 506(c) of Reg D
Property Coin (PCX)	Over $50m targeted	→ Security Token backed by a professionally managed portfolio of fix and flip real estate and loans → Issuing under Rule 506(c) of Reg D and Reg S
Aspen Coin	$18m	→ Aspen Coins are tokenized securities issued through Securitize. Aspen Coins present holders with equity ownership stakes in the St. Regis Aspen Resort in Colorado → Issuing under Rule 506(c) of Reg D
Art Token	$5.5m	→ Tokenizes artwork, allowing multiple investors to hold a specific share of value in the object → Issued by Swarm as an SRC20 token
Harbor (The Hub at Columbia REIT Token)	$20m targeted (May-19 close)	→ Similar to Aspen Coins, the Harbor platform has tokenized real estate offering from Convexity Properties, a student housing project → Issuing under Rule 506(c) of Reg D
tZero	$134m	→ Tokens issued to investors with fully executed SAFEs. → Issuing under Rule 506(c) of Reg D
SMART VALOR	CHF1.5m	→ Based in Switzerland → Goal is to democratize access to wealth by creating a portfolio of assets in which token holders share ownership
BRAID Token	$1.5m	→ A feature film, BRAID, fully financed through an equity crowdsale. The aim is to give viewers a say in what movies are made and how they are made → The token design and launch was done through Consensys

The above information can be visualized more effectively with the graphs on the following page.

Amount Raised Per Issuance Platform Thus Far ($m)
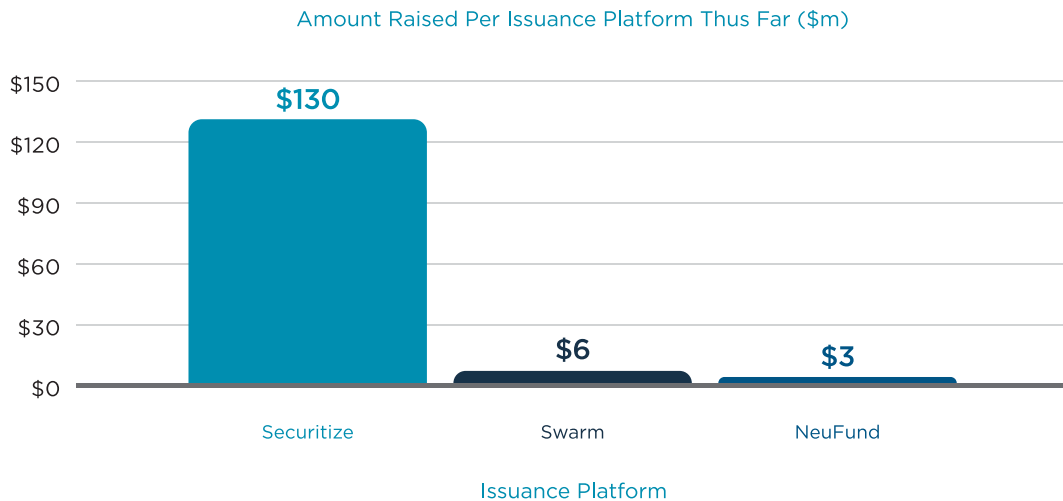
Figure 5. Amount Raised On Each Issuance Platform Thus Far (in $m)

From Figure 5 one can clearly see that Securitize has taken an early lead in the race between issuance platforms, with c. $130m in amounts raised on its platform. This can be attributed to a combination of first-mover advantage (Securitize launched 9-months before Polymath), as well as a quality team which has effectively built out a quality platform and pioneered developments in the STO space. Swarm is the only other issuance platform thus far with an STO (ArtToken), while Polymath and others are preparing launch STOs in 2019.

Amount Raised Per Security Token Offering Thus Far ($m)
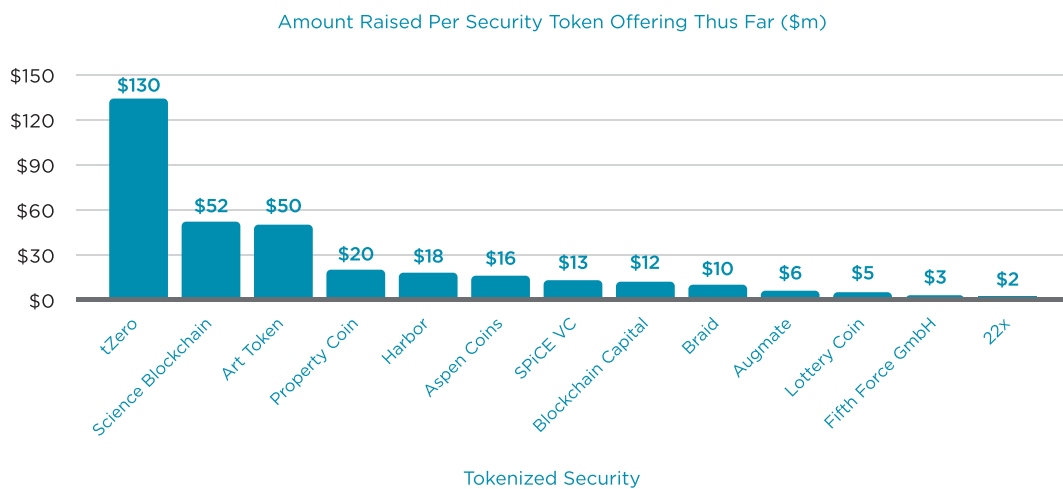
Figure 6. Amount Raised Per Security Token Offering Thus Far (in $m) [15]

While tZero appears to be the largest amount raised via an STO thus far (c. $134m), a clear trend is the number of STOs for real estate (Property Coin, Aspen Coin etc.) and investment funds (Science Blockchain, Spice VC, 22x, Blockchain Capital etc.).

15 - The Hub reflects $20m targeted amount

4.4 Fundraising Announced Via STOs Thus Far

From Kelper Finance data below [16], one can see that most of the issuers that announced upcoming deals are located in the United States, as the infrastructure is reasonably developed. Germany potentially becoming a Blockchain Hub in Europe as there are various lobbying initiatives made by key market players such as Neufund, which aims to democratize equity fundraising. The data below reflects fundraising processes which have only been announced, and where probability of completion is not considered.


Figure 7. *STOs by Deal Value Announced ($)*

- 1m to 10m — 6%
- 50m to 100m — 13%
- 100m to 500m — 6%
- 200k to 1m — 6%
- 10m to 50m — 28%
- To be Announced — 41%
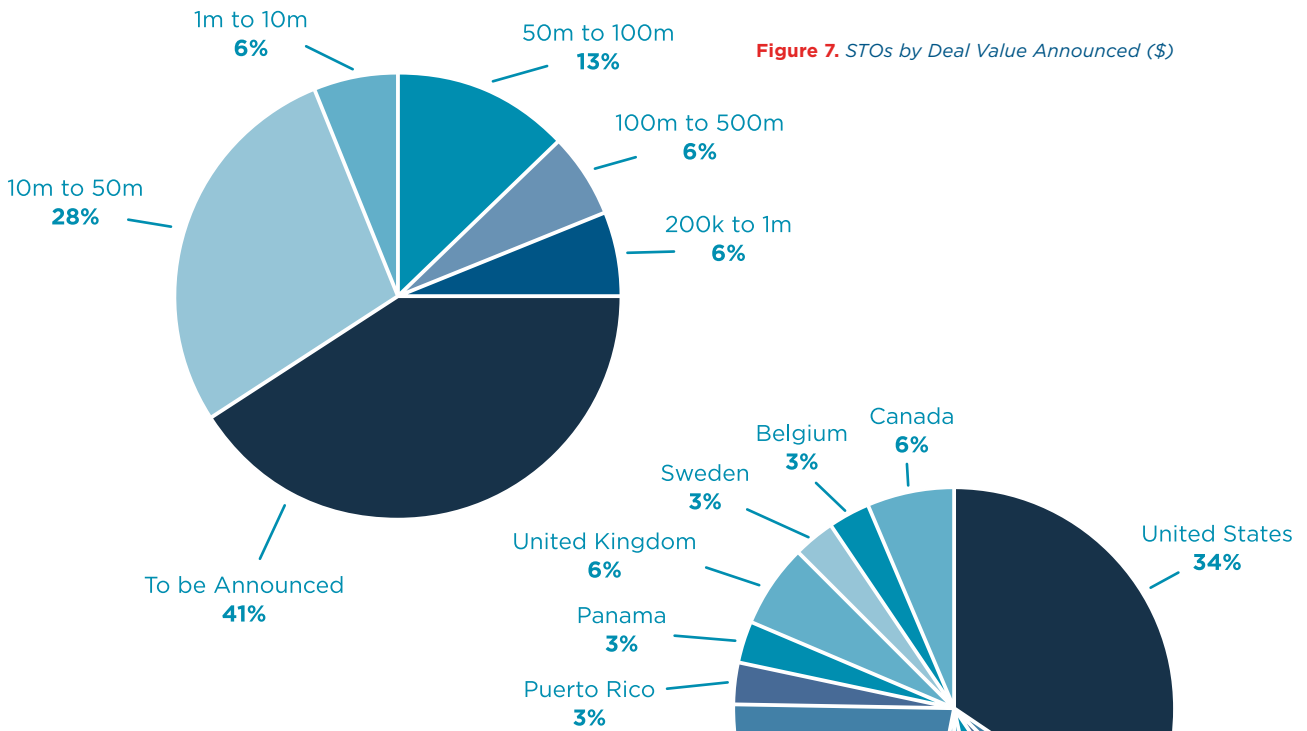
Figure 8. *STOs by Country of Origin*

- Canada — 6%
- Belgium — 3%
- Sweden — 3%
- United Kingdom — 6%
- Panama — 3%
- Puerto Rico — 3%
- United States — 34%
- India — 3%
- Switzerland — 3%
- Malta — 6%
- Finland — 3%
- France — 3%
- Germany — 22%

Figure 9. *STOs by Industry Share*

- Prop Tech — 13%
- Energy Tech — 3%
- Health Tech — 3%
- Energy — 6%
- Intellectual Property — 3%
- Mobility Property — 9%
- Art — 3%
- E-Commerce — 6%
- Retail — 6%
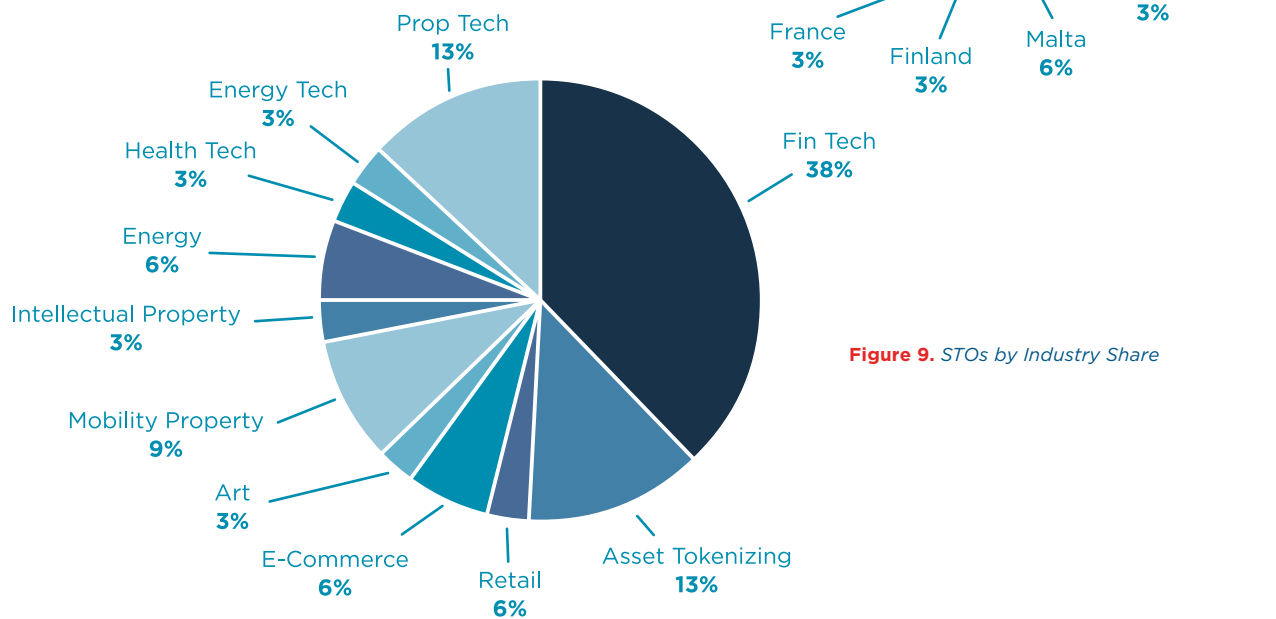- Asset Tokenizing — 13%
- Fin Tech — 38%

16 - **Digital Securities Market Research 2019** - Kepler Finance (Jan-19)

5. Open Finance Primitives and The Security Token Stack

Use Case, Applications, Regulatory Standards and Potential Future Developments.

DEFINITIONS:

→ A *utility cryptoasset* is one that is essential to the usage of a product or service.

→ A *security cryptoasset* is one that is not essential to the usage of a product or service.

Security Tokens should imitate the economic behavior of the underlying asset. The Security Token framework (and the potential future applications) can be thought of as follows:
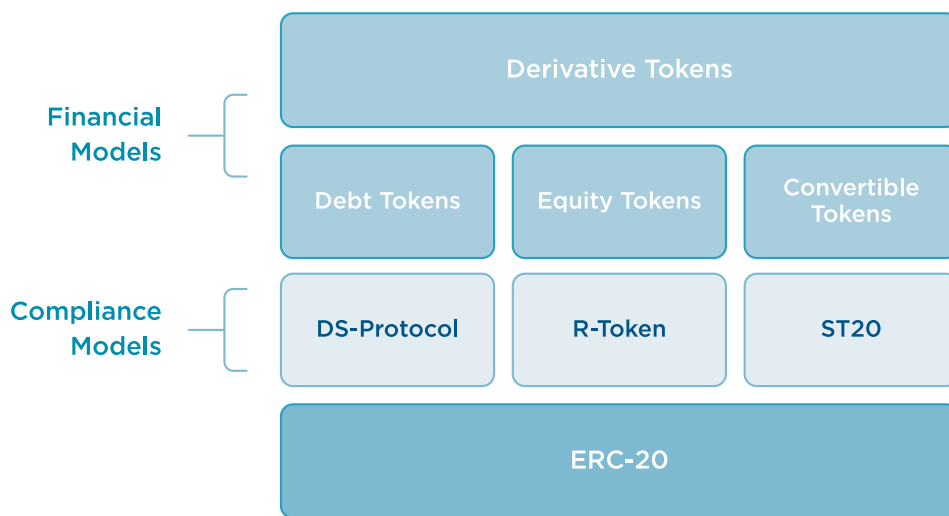
Figure 10. *Breakdown of the Security Token stack* [17]

5.1 Debt Tokens: Tokens that represent a debt or cash generating vehicle

Debt Security Tokens are tokenized assets that represent debt instruments (e.g. real estate mortgages or corporate bonds). Typically, the behavior of debt Security Tokens will be dictated by two key characteristics, which would be used to model the pricing of the token:

→ **Coupons:** Debt Security Tokens are typically structured to produce a regular coupon based on the payments of the underlying debt instrument.

→ **Risk:** Debt Security Tokens are subject to risks of default of the debtors or drastic changes in the valuation of the debt.

While the World Bank has already tested issuing a bond on blockchain infrastructure, successfully raising A$110m in an Australian-domiciled offering [18], the compelling innovations are likely to happen at the corporate bond-level (a c. $50 trillion market [19]). The global corporate bond market trades on over-the-counter (OTC) markets and is largely inaccessible to anyone but institutional or wealthy investors.

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17 - <u>Security Tokens 2.0 Protocols: Debt Tokens</u> - Jesus Rodriguez, Invector Labs (Aug-18)
18 - <u>World Bank Prices First Global Blockchain Bond, Raising A$110m</u> - The World Bank (Aug-18)
19 - <u>Corporate Bond Markets: A Global Perspective</u> - IOSCO Research Department (Apr-14)

Debt Tokens can generally be segmented further into 2 categories:

➜ **Tokenized Debt:** Tokenized representations of existing debt vehicles and automating the terms in an existing debt contract

➜ **On-Chain Issued Debt:** fully automated flow of funds on the blockchain. Dharma, a blockchain protocol that enables the creation and management of tokenized debt assets, is pioneering this space with fascinating implementations debt token structures. (see case study in Appendix)

The development of debt protocols and related products built on top could be represented by the timeline below as to the immediacy of development. (e.g. Tokenized debt via regulated STO platforms is a more immediate probable scenario than on-chain debt)
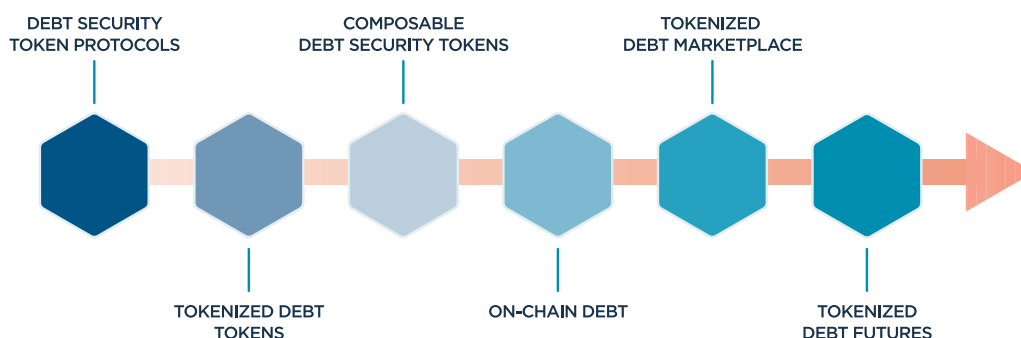

DEBT SECURITY TOKEN PROTOCOLS

COMPOSABLE DEBT SECURITY TOKENS

TOKENIZED DEBT MARKETPLACE

TOKENIZED DEBT TOKENS

ON-CHAIN DEBT

TOKENIZED DEBT FUTURES

Figure 11. *Potential Development Timeline of Debt Tokens and Blockchain-based Debt Productsc* [20]

The notion of 'programmability' present in Security Tokens is also common in Debt Tokens, and likely a strong catalyst to various financial innovations in the 'Open Finance' paradigm. The enforceability required in debt given the various covenants attached to debt, dividend payments, defaults, underwriting or yield rebalancing could be embedded into the logic of debt tokens. This programmability could enable potential innovations such as [20]:

➜ **Composable Debt Products:** Debt products could be combined in a single tradeable unit to be used as a hedge against different market conditions, balance different levels of risks and dividend models. Although this brings back nightmares of the abuse of Collateralized Debt Obligations (CDOs) in the 2008 Crisis, the open paradigm of blockchain based financial products could help to mitigate this occurring again

➜ **Fractionalized Debt Products:** lowered unit costs of debt products, although the issue of the Tragedy of the Anticommons [21] will need to be addressed

➜ **Debt-Equity ETF Tokens:** Although not a new innovation, one could postulate security tokens that combine baskets of debt and equity tokens into a single unit that balances the risks and returns for specific markets and investor profiles

➜ **Real-Time Dividend Distribution:** Coupon or dividend distributions largely occur quarterly, so rapid settlement within digital securities could enable rapid distributions. One could postulate a real-estate debt token programmed to distribute dividends to token holders every time a tenant pays his monthly lease.

➜ **Tokenized Incentives:** The use of game theoretical incentives and crypto-economics to incentivize good behaviors among the debt participants (e.g. reward for timely repayment, incentives for underwriters or auditors, payment for dispute arbiters etc.)

20 - **Cashflow on the Blockchain Part III: Reimagining Debt with Security Tokens** - Jesus Rodriguez, Invector Labs (Aug-18)
21 - **Tragedy of the Anticommons** - Alpen Sheth (Nov-18)

5.2 Hybrid/Convertible Tokens: Tokens that convert between debt and equity based on their behavior

A hybrid security is a financial security that is composed of two or more financial instruments, which can combine equity-like with debt-like features in a single tradeable financial product. By combining debt and equity in a single product, hybrid securities can balance the risk and return of the underlying financial primitives and hedge against different and specified market conditions, granting an investor a substantial amount of malleability over his investment decision.

Main Types of Hybrid Securities: [22]

→ **Convertible Bonds**

  → Convertible into equity at a predetermined date, paying a predetermined coupon rate to holders (and repayment of the principal amount at expiration should conversion not be exercised)

  → Convertible bonds are issued to attract investors who want the possibility of higher return but not the risk of owning stock at the outset

→ **Convertible Preference Shares**

  → Shares of a company's stock with dividends that are paid out to shareholders before common stock dividends are issued

  → Generally include an option to convert into a set number of common shares, generally any time after a pre-established date

  → As an investor, receiving dividends holds tax benefits versus earning interest via convertible bonds

Types of Hybrid Security Tokens:

Debt Security Token → Equity Security Token

→ **Convertible Debt Security Token**

  → Platforms such as Polymath or Securitize will use a Dharma Underwriter to issue a debt smart contract (with additional clauses)

  → Likely to also issue corresponding equity tokens based on shares of the company

  → Debt Security Token holders will receive a dividend based on the terms specified in the smart contract

  → After the defined maturity period expires, the debt Security Token holders have the option of converting their tokens into equity tokens

Preference Equity Security Token → Equity Security Token

→ **Convertible Preference Equity Token**

  → Implementations are still being tested with regards to this instrument, with the majority of options still implementing variations of SAFE/SAFT agreements

  → Overstock issued $134m in preferred equity tokens towards funding tZero in October 2018 ($200m targeted initially) towards investors who had signed a SAFE agreement with lock-up periods [23]

  → The token pays 10% adjusted gross revenue to token holders (distributed) on a quarterly basis

22 - Security Token 2.0 Protocols Part II: Hybrid Tokens - Jesus Rodriguez, Invector Labs (Aug-18)
23 - tZero SEC Offering Memorandum (Mar-18)

→ **Off-chain Convertible Equity Token** (or "Initial Convertible Coin Offering")

    → Companies can issue a Security Token which, after certain period of time, converts into shares in a company

    → Dubbed an ICCO or "tokenized convertible warrant", it is being tested in Malta where investors will be able to convert tokens into shares of Palladium after 3 years [24]

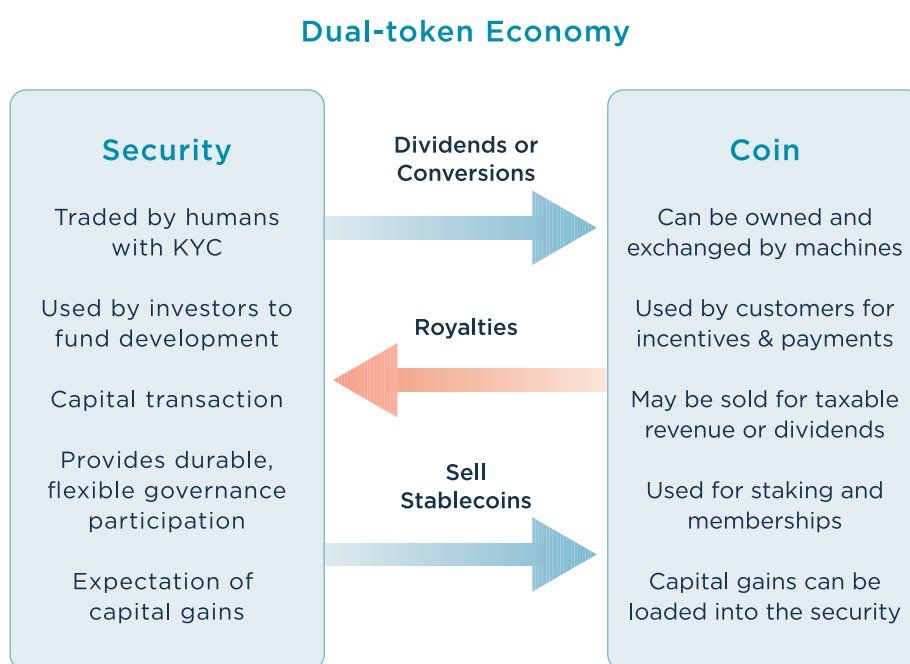## 5.3   Dual Token Issuance: Combination of Security and Utility Tokens

Dual-token Economy

Figure 12. *Highlights of the structure and mechanics of a proposed dual-token economy [25]*

The broad premise of a dual token issuance is to fundraise through a Security Token and power a protocol with a utility token.

Token-economic design would be paramount in this structure to ensure the alignment of incentives (between security and utility token) and the robustness of the protocol itself (where the majority of the value will be captured).

As an example of how this offering could be structure, the FACTS [26] approach details a compelling stepwise approach:

i.   Offer a Reg. D compliant Security Token to accredited investors in the USA, with a 12-month lock-up

ii.   Once the ICO is complete (or the protocol is fully built out), the company distributes a concomitant amount of utility tokens to Security Token investors

24 - <u>World's First Initial 'Convertible Coin Offering (ICCO)' Launches in Malta</u> - Gerald Fenech (Jul-18)
25 - <u>The dual-token ICO is legal even in the US</u> - Andy Singleton, Aboveboard (Aug-18)
26 - <u>The Basics on FACTS: A New Model for Compliant ICOs</u> - Jaron Lukasiewicz (Oct-17)

5.4 Derivative Tokens: Tokens that derive its value from underlying tokens [27]

Financial derivatives (instruments which derive value from the underlying asset) are an essential component of an institutional investor's toolkit to manage risk. Derivatives can take various forms to achieve this goal, which will gradually be implemented to make cryptoassets a more attractive vehicle for institutional investors:

→ **Future/Forward Model:** agreements to execute a transaction at a specified price sometime in the future.

→ **Options Model:** Provides right (but not the obligation) to buy or sell the underlying Security Token at a specified price on a specified date.

→ **Swap Model:** Exchanges the dividends or cash flow produced by two different Security Tokens to serve as a hedge or insurance against future market conditions.

Current projects attempting to deliver a toolkit can segment these by the various issues investors are generally concerned with and think about how to apply financial products to trades:

→ **Liquidity:** Can I achieve liquidity in an investment independently of market conditions?

→ **Example: dYdX**

dYdX offers an innovative solution for margin trading. **dYdX Margin Tokens** are ERC20 compatible tokens which move positively or negatively based on the performance of the underlying asset. Each type of margin token has a specified interest rate, expiration date, and amount of held token locked in the position per unit owed token sold through the dYdX margin position.

i. Balance: Can I seamlessly get exposure to a balanced, broad portfolio that fits my investment thesis?

Example: SET Protocol

The **SET Protocol** is an ERC20 compatible protocol which enables the composition of different tokens under a single tradeable unit. A SET token is collateralized by the underlying tokens which are trustlessly kept in custody. Issuers can create new SET tokens at any time or redeem the underlying tokens. SET tokens can be composed of other SET tokens which enables one to architect sophisticated financial products.

ii. Insurance: Can I protect myself against underperformance of a specific token?

Example: VariabL

VariabL (formerly StabL) proposes a method to structure 'call' or 'put' options on cryptoassets. Although similar to dYdX, VariabL Zero-Sum contracts match long and short positions in a way that the profits of one trader always match the losses of the other trader. Using Zero-Sum contracts, an investor can create a 'put' option that bets on a price decline on a specific token over a period of time.

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27 - **Security Token 2.0 Protocols Part III: Fund and Derivative Tokens** - Jesus Rodriguez, Invector Labs (Sep-18)

5.5 Compliance Layers & Token Standards: Protocols which enable automated compliance procedures during issuance and trading of Security Tokens [28]

- **R-Token**—a standard developed by Harbor that focuses on real estate and accredited investors
  - Corroborates users against a whitelist at the token level.
  - To be compliant, a smart contract communicates with a "Regulator Service," where that ownership is stored off-chain (i.e. with Harbor).
- **ERC-1400**—(formerly known as ST-20) a standard developed by Polymath
  - Offered to accredited investors only.
  - Functions as an umbrella that interoperates with several other token standards to handle fungible and non-fungible trading restrictions (e.g. ERC-1594 for injecting off-chain data, ERC-1410 for partitioning balances, ERC-1644 for controller operations, ERC-1643 for document management).
  - On-chain ownership is claimed but it is not detailed how this is legally binding.
- **ERC-1450**—a standard developed by StartEngine
  - Simply a digital stock certificate where an investor can take possession of their tokenized certificate but cannot transfer it.
  - Ownership is stored off-chain with a registered transfer agent who can initiate the transfer after a trade was completed on an ATS by a broker-dealer.
  - Compliant with Regulation Crowdfunding and Regulation A.
- **SRC20**—a standard developed by Swarm Fund
  - Swarm is an asset tokenization platform that runs on a utility token (SWM), and Swarm users can buy Security Tokens (SRC20) on Swarm's private blockchain.
  - Trading of SRC20 tokens also occurs on the private blockchain to ensure that Swarm can monitor trades and ensure compliance.
  - Designed to interoperate with other compliant platforms.
- **DS Token**—a standard developed by Securitize, a company that focuses on the entire lifecycle of STOs, including compliance and primary issuance of securities
  - Handles issuance, paying dividends, and voting rights.
  - To make secondary trading compliant however, all trades must be approved by their 'Compliance Service,' an on-chain control unit, that references an on-chain registry to verify investor status before executing the trade.
- **ERC-884**—a standard developed by David Sag, in which each ERC-884 token represents a single share in a Delaware corporation
  - Designed for equity sales, where the owner of the token must be whitelisted (confirmed through the smart contract).
  - To be compliant, issuers of ERC-884 must maintain an off-chain private database.
- **ERC-1404**—a standard developed by Tokensoft
  - Token issuer can restrict the transfer of those tokens, depending on the offering's needs and the regulation of their jurisdiction.

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28 - **The Security Token Standard** - Howard Marks (Dec-18)

5.6 Developing Regulatory Standards

Existing Framework (excl. the SAFT)

→ <u>SAFT-E</u> - Simple Agreement for Future Tokens and Equity

→ An agreement that offers investors either tokens in the future, or equity in the future, whichever happens first (or a mix of the two).

Proposed Frameworks

→ <u>DATE</u>—Debt Agreement for Tokens and Equity

→ This structure offers a convertible note (bond) or straight debt token with the utility token as a perk.

→ <u>FACTS</u>—Fair And Compliant Token Sale

→ The FACTS model uses both a Security Token and a utility token.

→ Security Token is offered to accredited investors and is compliant with the SEC in the US under a Reg. D filing with a 12-month lock-up.

→ Utility token is subsequently distributed after the ICO in the form of a property dividend to investors.

6. STO Process & Timeline

Launching an STO is a complex undertaking, in an especially nascent market, so additional due diligence and preparation must be undertaken to conduct a successful process.

Probable timeline structure:
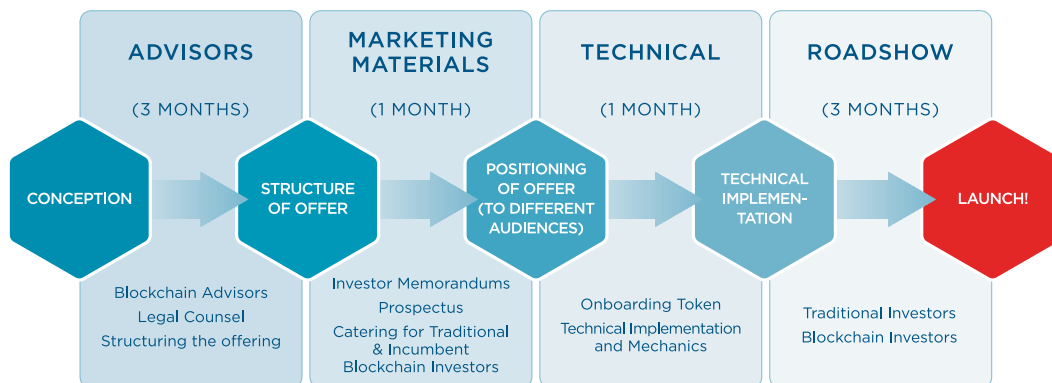
→ **Advisors:** 3-months working with advisors and legal counsel on structuring the offering, and creating the various investor memorandums and prospectuses (as required).

→ **Marketing:** 1-month compiling the marketing materials, which will need to be positioned for two different audiences (incumbent blockchain investors and traditional institutional & retail investors).

→ **Technical:** 1-month working with a technical team to onboard the Security Token onto the chosen issuance platform.

→ **Roadshow:** 3-months in conducting a roadshow for both traditional and blockchain-focussed investors.

7. Concerns & Areas Still To Be Proven

While the Security Token premise is incredibly compelling, there are still unproven facets of the thesis that require consideration:

TABLE 7 - HIGHLIGHTS AND COMMENTARY OF THE VARIOUS CONCERNS AROUND THE VIABILITY OF STOS

BENEFIT	COMMENTARY
Liquidity Farce	→ Liquidity in pre-product market fit induce misaligned interests → Founders want supportive investors (not speculators) who provide backing when 'times are tough'
Enterprise Infrastructure	→ Systems are disjointed and clunky → Enterprise will struggle to integrate with blockchain infrastructure if benefit to doing so not immediately clear, thereby dampening the promise of liquid markets
Shifting of Responsibility	→ Removing intermediaries shifts responsibility from trusted middlemen to buyer and seller → Not clear whether the need is great enough to justify this drastic change in user experience (UX) → Financial institutions, advisors and certain intermediaries do serve functions which are difficult to codify
Recentralization Vector	→ Security Tokens will require custodial solutions which will introduce a centralization vector → Additional layers and implementations tending towards simply recentralizing towards the old paradigm (albeit with benefits of opening up new markets and automating a number of procedures across interoperable asset bases) → If interoperability standards are not prioritized, data and operations could be siloed, returning financial markets to the current paradigm (i.e. same paradigm, different backbone)
Disclosure Requirements	→ Opening up new markets to retail investors will require investor protections, and therefore stringent disclosure requirements and administration → Will lead to increased costs which could outweigh the purported cost efficiencies STOs enable → Not proven yet if the benefit of access to new capital pools would outweigh these costs
Determination of Ownership	→ Regulatory reform has not kept pace with the intent to tokenize new assets (e.g. Art) → Muddies the waters in determining ownership and governance rights
Tokenization of Failure	→ Significant majority of startups fail in the first 3-years, therefore tokenizing these companies will detract investors over the long term → Could lead to eventual decline in demand for STOs as low success rate not attractive for investors
Adverse Selection	→ Security Tokens could be viewed as the funding avenue of last resort if successful raises are minor

8. Conclusion

Security Token Offerings are a novel fundraising mechanism which bakes a layer of regulatory trust and certainty into the offerings. These are contractually-bound, legally-enforceable obligations backed by the might of the law which will provide a certain degree of comfort for investors who will invest in this space given the familiarity with these policies and structures. This comfort does however come at the price of increased disclosure requirements.

The Newtown Partners thesis surrounding STOs is as follows:

→ **Over the next 12 - 18 months:** Given that the certainty provided by regulated instruments and their associated rights is a large short-term attraction for investors, Newtown Partners believes STOs will be the preferred capital raising avenue for startups in the blockchain space (on top of any asset tokenization endeavors).

   → Security Tokens will not replace utility tokens in providing core functionality to decentralized protocols, but the two tokens will exist:

      → Symbiotically in a unified system, existing somewhere along the spectrum of decentralization where this structure makes sense.

      → Or provide some kind of convertibility option to utility tokens once a network reaches decentralization.

   → In this light, various structuring mechanisms will be tested, but we believe a SAFT-E will be the favored offering for investors given the flexibility it provides, with Malta, Gibraltar and Singapore providing acceptable regulatory frameworks to do so.

→ **Over the longer term:** provided interoperability standards are prioritized, we believe compelling innovations will be built on top of this open, trustless and complete financial architecture. The ability to codify the regulatory certainty mentioned above to create a trustless transactional environment while reducing associated enforcement costs will further bolster the development of the sector. The promise of heightened liquidity is still very much up for debate, with the risk of regulatory dampening introducing some risks to this progression.

9. Authors

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11. Bibliography

Thanks must be given to the various luminaries in the space, whose writings listed below have been collated and consolidated into the Security Token Primer. Particular mention must go to **Howard Marks** (CEO of StartEngine, co-founder of Activision), **Antonio Pompliano** (Morgan Creek Capital), **Tatiana Koffman** (Four Blocks Ventures), **Bruce Fenton** (Atlantic Financial), **Steve McKeon** (University of Oregon), and **Jesus Rodriguez** (Invector Labs) whose insights are incredibly prescient and referred to frequently throughout the document. Any omissions or errors are of our own; please reach out if you have any feedback.

For further reading, please see a collection of excellent and extensive pieces surrounding Security Tokens below:

11.1 Summaries & Overviews

→ Security Token Network - The STO Ecosystem

→ Mapping out the Security Token Ecosystem - The Block

→ What are Security Tokens? (Fully Comprehensive Guide) - Blockgeeks

→ The Future of US Securities Will Be Tokenized – Hacker Noon

→ The Security Token Anthology: August 2018 Edition – Hacker Noon

→ Securities Tokens Video Series – Bruce Fenton – Medium

→ A Step-by-step Guide on How to Launch an STO - ChainPlus

11.2 State of The Security Token Market

→ Is 2018 the Year of the Security Token? | Investopedia

→ Primer on Security Tokens - Decipher Capital - Blockchain Fund

→ The Official Guide To Tokenized Securities – Anthony Pompliano …

→ Compliant Security Token Trading with MAP — Part One - Medium

→ The State of U.S. Securities Tokens, Q4 2018 – New Alchemy – Medium

→ State of Securities: Token Regulation and Solutions | Hacked.com

→ Your Official Guide to the Security Token Ecosystem - Medium

→ Security Tokens Set To Take Center Stage In 2019 - Nasdaq.com

→ Security Tokens: How Wall Street and Blockchain Will Collide - Medium

→ How Security Tokens Will Transform Traditional Finance - Hacker Noon

→ The Security Token Thesis – Hacker Noon

→ The Security Token Anthology: August 2018 Edition – Hacker Noon

→ What We Need To Enable The Security Token Thesis – Coinmonks …

11.3 Regulatory Landscape

→ Global Security Token Regulations: What You Need To Know - Medium

→ Understanding the Regulatory Framework of Security Tokens - Medium

→ Initial Coin Offerings: Are Tokens Securities under EU Law? | Oxford …

→ On the Current State of Security Tokens – Hacker Noon

11.4   Venue

→ Security Token Exchanges Launching in Q42018 and 2019

→ Token Up #2: Your Complete Guide to Security Token Exchanges

→ Exploring The Top Security Token Exchanges - 2019 Edition - CoinSutra

→ Popular Security Token Exchanges around the World – The Startup …

11.5   Security Token Stack & Applications

→ Defining the Security Token Stack – Harbor – Medium

→ The Security Token 2.0 Stack – Hacker Noon

→ Security Token 2.0 Protocols Part II: Hybrid Tokens - Hacker Noon

→ Security Token 2.0 Protocols: Debt Tokens – Hacker Noon

→ The Two Token ICO – Hacker Noon

→ A Dual Token Structure of Utility and Security Tokens - Medium

→ Automated Regulatory Compliance of Security Tokens – Yos Riady …

→ Liberal Radicalism and Security Tokens: Quadratic Voting as a …

→ Token Equity Convertible (TEC) — a new way to invest in Crypto …

→ The Two Token Waterfall

→ Token-Redeemable Equity: A New Model for Blockchain Project …

→ A Dual Token Structure to Solve the Catch-22 of SEC "Compliant …

→ Tokenomics & the Importance of Strategic Token Structure - Medium

→ The Dual Token Structure Thesis – Good Audience

→ The 2019 Truth On Security Tokens – Loopring Protocol – Medium

11.6   Challenges

→ Blockchain and Security Tokens (a/k/a Digital Securities): A Securities …

→ Security Tokens Don't Solve The Regulatory Mess of Utility Tokens

→ From Initial Coin Offerings to Tokenised Securities: Far From the End …

→ Against Security Token Standards – Hacker Noon

→ Blockchain Ownership & Crypto Anticommons - Good Audience

→ Security Token skepticism – Angus Champion de Crespigny – Medium

→ The Tokenization of Real Estate - Sina Habibian

→ 20 Ideas About Security Tokens That Most People Disagree With

12. Appendix: Security Token Case Studies

12.1 Debt Security Token Case Study: A Debt Security Token Protocol [29]

Dharma is a blockchain protocol that enables the creation and management of tokenized debt assets, based on four fundamental components:
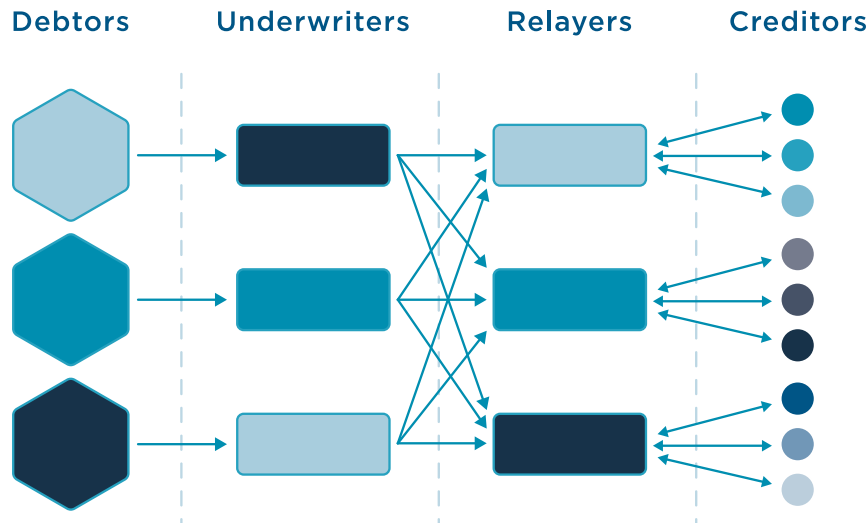

Figure 1. *Flow of interactions between different agents and keepers*

→ **Debtor:** A party in a debt transaction who is borrowing an asset and owes a creditor some agreed upon value.

→ **Creditor:** A party in a debt transaction who is lending an asset is owed some agreed upon value by a debtor.

→ **Underwriters:** Entities that collect fees for administering the public issuance of debt and pricing borrower default risk into the asset.

→ **Relayers:** Entities that aggregate signed debt order messages and host the messages in a centralized order book and provide retail investors with the ability to invest in the requested debt orders by filling the signed debt orders.

Debt agreements in Dharma are represented by Term Contracts which include elements such as repayment terms or risk models and programmatically query the repayment status of the debt asset during and after the loan's term. At the most basic level, a Security Token platform adopting Dharma would play to the role of a Relayer and integrate with a network of Underwriter nodes.

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29 - **Security Tokens 2.0 Protocols: Debt Tokens** - Jesus Rodriguez, Invector Labs (Aug-18)

12.2 Hybrid Security Tokens Case Study: Two Token Waterfall Proposal

The Two Token Waterfall [30] is an initiative proposed by the founders of Airswap to introduce interoperability and transparency to equity and debt funding instruments. The proposal is a structural framework for representing the entire capital stack of alternative investments in a digital format to leverage distributed ledger technology to store and transfer interests. Regulatory compliance and adherence to the legal agreements are codified into the smart contract. Administration of the tokens is via third party administrative agent/trustee multi-signature wallet.

(A)
→ Replicates debt
→ Preferred rate
→ Minority percentage of upside
→ Secured lien on asset

(B)
→ Replicates equity
→ Control
→ Majority percentage of upside
→ Member-manager

Figure 1. *Total Capitalization of Deal*

Structure:

→ **Token A:** senior in priority of payments replicating debt.

→ **Token B:** junior in priority of payments replicating equity.

An example can be used in constructing a bridge loan for a non-cash flow generating property with a short expected time to sale, with the following structuring:
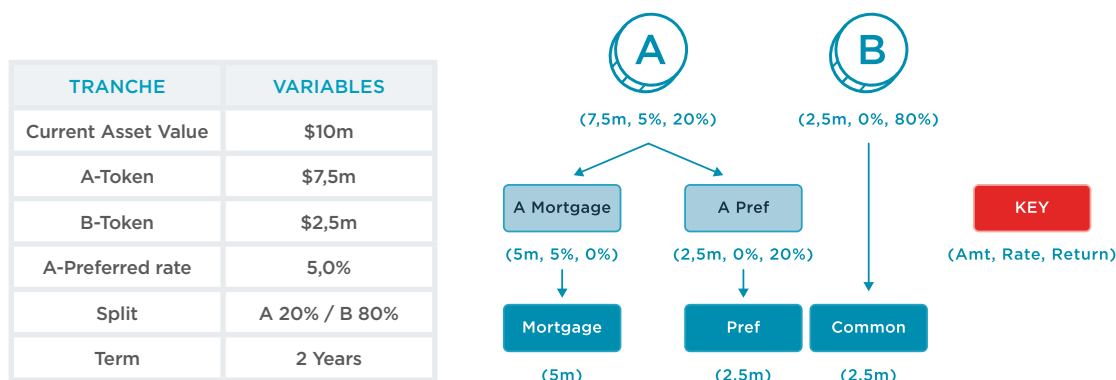

TRANCHE	VARIABLES
Current Asset Value	$10m
A-Token	$7,5m
B-Token	$2,5m
A-Preferred rate	5,0%
Split	A 20% / B 80%
Term	2 Years

A (7,5m, 5%, 20%)   **B** (2,5m, 0%, 80%)

A Mortgage (5m, 5%, 0%)   A Pref (2,5m, 0%, 20%)

Mortgage (5m)   Pref (2,5m)   Common (2,5m)

KEY (Amt, Rate, Return)

Figure 2. *Structure of Example Property*

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30 - <u>Two Token Waterfall</u> - Todd Lippiatt, Michael Oved (Sep-18)

The payoff profiles for the debt (A) and equity (B) components can be thought of as shown below (sales prices ranging from $5m to $15m to illustrate the payoff profile):
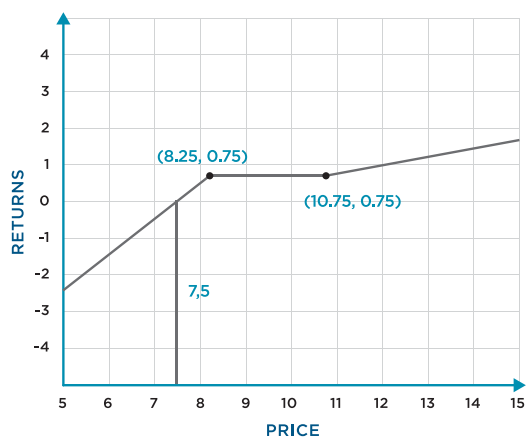
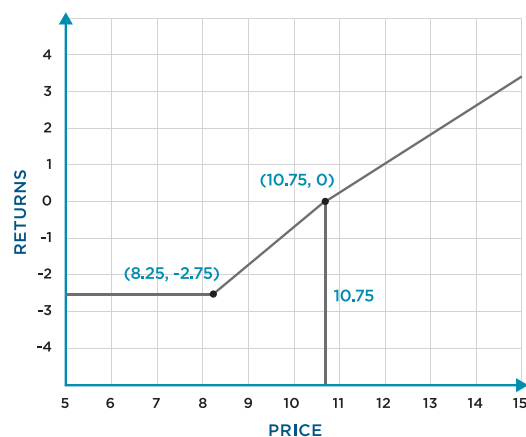

Figure 2. *Payout of A-Token holder ($ millions)*

Figure 3. *Payout of B-Token holder ($ millions)*

The benefits of this model are summarized below:

➜ **Value Transparency**

  ➜ The two tokens tradeable on a secondary market should remain in equilibrium as the the structure is formulaic, the asset price is transparent and not subject to discretion

➜ **Aligned Incentives**

  ➜ B-token (equity) holder typically being the issuer, has flexibility in timing of the future sale as execution is largely unknown (sacrificing upside in turn)

  ➜ B-token holder does not pay interest on an ongoing basis, but simply accrue and are paid when the deal matures (implying lower working capital requirements)

  ➜ A-token (debt) holder has collateralized return and potential for upside (effectively replaces the senior lender or bank in many transactions)

Dual Token Issuance Case Study: Siafunds [31]

In designing the Sia protocol, Sia implemented a dual-token structure: a utility token (Siacoin) and a revenue-sharing tokenized security (Siafunds).

➜ **Siacoin**

  ➜ The utility token was not used for fundraising, and the software was distributed for free

  ➜ Utility tokens exist to provide access to a good or service on a decentralized, blockchain-based network (Sia's utility is cloud storage)

  ➜ Renters on Sia use Siacoin to purchase storage space from a worldwide network of hosts, and hosts receive Siacoin in exchange for storing renter data

➜ **Siafunds**

  ➜ Siafunds are revenue sharing tokens. Siafunds, by contrast, derive their value from the present and future value of the storage-related transactions on the Sia network

  ➜ Siafunds entitle their owners to a fixed portion of the fees paid by renters and hosts on the Sia network. This portion amounts to an aggregate of 3.9% of all storage contract spending

31 - **The ICO Paradox - And How To Fix It** - Zach Herbert, Sia (Mar-18)

12.3   Case Study: Potential Future Security Token Designs

Application and implementation of new technologies generally follow the availability heuristic initially. This has been discussed by preeminent VC's Fred Wilson and Chris Dixon at length, but is poignantly summarized by Professor Mitchell Stevens (NYU) [32]:

"Many early programs such as Amos 'n' Andy (1951) or The Jack Benny Show (1950–65) were borrowed from early television's older, more established Big Brother: network radio. Most of the formats of the new programs' newscasts, situation comedies, variety shows, and dramas were borrowed from radio, too"

Implementing what we know initially is common place, but inevitably means the entirety of the design space is not fully explored. While placing a blockchain-wrapper on current financial implementations and instruments is beneficial in and of itself simply from the pure incremental efficiency gains (as well as democratizing access to investment opportunities), the really compelling innovations are still to be conceptualized and built out. Some interesting concepts have emerged in the broader Security Token anthology:

→ **Ownership Characteristics**

   → Tenured Voting [33] - where the longer one holds a stock, the more votes one accumulates

   → Quadratic Voting [34] - Security Token holders are granted a fixed allocation of 'voting tokens', where a holder purchases votes with these tokens at a squared cost per vote (e.g. exponentially increasing the cost per vote)

→ **Access Rights**

   → Tokenization of access rights to follow-on rounds in a venture capital fund

   → Could extend to integrate product markets with capital markets to try align users and investors, in the same vein as utility tokens but not constrained to the digital economy (e.g. minority investors in a retail store or brand, with access to discounts)

→ **Value / Rights Unbundling**

   → Unbundling of economic rights (dividends or segmented revenue streams which could be financed independently) and governance rights

   → This falls victim to the "Tragedy of the Anticommons" [35] however, where overlapping rights (ownership generally) result in differing opinions on direction and gridlock

→ **Cross-Asset Referencing**

   → Innovations can be structured around interoperability and complete contracts

   → Tokenization of the equity and debt components in a house could allow automated restructuring

      → In the case of defaults on mortgage repayments, debt token holders could receive equity tokens in lieu of missed payments (compelling idea as foreclosure is a costly exercise)

   → Allowing novel assets which have been newly tokenized to be put up as collateral for debt agreements

      → E.g. Cellular data used as collateral for microloans

32 - **Technological Trends, Financial Capital, and the Dynamics of Disruption** - a16z (Sep-18)
33 - **The Craziest Idea in Silicon Valley** - Eric Reis, Author of The Lean Startup (Apr-18)
34 - **On Radical Markets** - Vitalik Buterin (Apr-18)
35 - **Tragedy of the Anticommons** - Alpen Sheth (Nov-18)