WHITE PAPER

Unlocking the Next Wave of Tokenized Assets

The Roadmap for Redefining Custody, Creating Standards, and Designing New Value Chains for Credit

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Unlocking the Next Wave of Tokenization Adoption

Blockchain technology has disrupted the financial services industry in a variety of capacities over the past 10+ years. Today, over 10% of the global population owns cryptocurrencies, and major institutions across the globe (from banks to brands) have embraced the opportunities that technologies like NFTs can offer.

The tokenization of credit assets is another area in which blockchain has the potential to seriously disrupt the current landscape. Tokenization, or the conversion of the rights of physical assets or financial instruments into digital tokens on the blockchain, can offer a new level of efficiency and effectiveness for managing credit assets. Some of the benefits already being realized by early adopters include reduction in settlement times, more composable financial instruments, and products for connecting borrowers and lenders that were once not possible.

To realize the full potential of credit asset tokenization and to drive true adoption, there are certain areas within the market infrastructure that need to improve:

1. **Redefine Custody:** While enterprise-grade custody solutions have emerged, the mindset around custody needs to shift and new business models need to be built.
2. **Create Standards:** Standardization in data, reporting, and operational practices for tokenized assets must be established to create transparency and interoperability, and to unlock efficiencies within the system.
3. **Design New Value Chains:** Streamlined infrastructure that can enable new systems for originating, managing, and investing in debt assets.

This paper, co-authored by Fireblocks, Centrifuge and BlockTower Credit, aims to delve into these three areas requiring further innovation in order to accelerate the adoption of tokenized credit assets. By addressing these challenges, we can unlock the next innovation curve for blockchain technology and usher in a new era of financial inclusion and efficiency in credit markets.

Fireblocks

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Redefine Custody in the Digital Asset Era

With the introduction of blockchain and digital assets, concepts around what exactly "custody" entails within financial markets have begun to shift – and this process needs to continue in earnest to support innovation and growth for tokenized credit assets.

Today, it is no longer a technical requirement to utilize a vault or a third party to hold assets. The blockchain itself serves the role of the "custodian" and the owner of the private keys controls the assets. Let's take a deeper look at three specific innovations within this broader reframing of custody:

- **Custody shifts from paper to private keys**
- **Enterprise-grade custody is introduced**
- **Space for new business models arises**

From Paper to Private Keys

Custody of securities has evolved dramatically over the last 60 years, moving from paper-based certificates of record to digital versions. This shifted the role of a custodian from being one of physical protection and safeguarding of assets (physical records) to housing electronic records. This also meant custodians needed to offer more ancillary services, such as fund administration, prime brokerage, and securities lending.

Custody has once again fundamentally changed with the advent of digital assets – in terms of both the nature of custody, as well as what exactly is being held.

Digital asset custody consists of the safeguarding of private keys, or long alphanumeric strings that allow an asset owner to sign digital contracts to

transfer digital assets from one wallet to another. These private keys live on the blockchain; there is no physical private key that an individual or institution holds.

One large difference from traditional custody that has arisen as digital assets grow in prominence is that both individuals and institutions can choose to custody their own assets, meaning they can choose to manage their own private keys. Another major difference that digital asset custody has introduced is the potential for large scale efficiencies when it comes to settlement, deployment, and holding costs. In a self-custodial framework, assets can spend more time being productive and less time in transit, being validated, or secured.

Enterprise Custody Solutions for Institutions

While digital assets have only been in existence for approximately 15 years, the rate of change within this space has been incredible – and there is no better place to see this transformation than in custody.

Choosing the right custody infrastructure should be evaluated from a cybersecurity perspective and the changes institutions have adopted in their custody stack reflect this. Digital asset custody has evolved from unsecure browser-based hot wallets, to more secure but lower-efficiency hardware wallets, to today's custody providers and qualified custodians.

> *The advancement in enterprise grade custody solutions will enable secure, transaction-based products and services that will unlock the potential of blockchain for financial markets.*

The signing algorithms used for asset transfer have also evolved, with the major innovation being the leap to MPC-based signing (multi-party computation), in which private keys are algorithmically divided so that the entire private key is never actually put together in one place.

Today, there is a set of highly secure, scalable and flexible custody infrastructure solutions (such as Fireblocks) for institutions to utilize. These solutions enable enterprise users to safely store and transfer digital assets, manage treasury assets, and connect with counterparties. The advancement in enterprise grade custody solutions will enable secure, transaction-based products and services that will unlock the potential of blockchain for financial markets.

Space for New Business Models Arises

In traditional financial markets, custody has mainly been the baseline for offering ancillary services based on regulatory frameworks put in place decades earlier. The advent of blockchain-based infrastructure has introduced the idea of decentralization, and the ability for both retail investors and institutions to take control of their assets.

It's been said that blockchain unlocks the ability to "tokenize the world." Theoretically, everything has some form of value – and tokenization enables any object to verifiably solve for the double-spend problem and implement a single source of truth. Assets issued on blockchain are managed through immutable code called smart contracts, where they are also secured and deployed using private keys. The ability to manage the issuance and life cycle of assets onchain in a secure manner is critical to the adoption of blockchain within financial markets. This technology can empower people to control their own assets and monetize them in a wide range of ways. It opens completely new opportunities and greater accessibility to existing ones.

Key developments for custody will take shape in new business models that take advantage of the reduced cost of custody to help onboard a new wave of underserved customers. Institutions can now offer both custodial and non-custodial features to clients that enable innovation and interoperability on a new level.

Create Tokenization Standards

Within traditional financial markets, numerous organizations and standards govern the trading of securities (e.g., ISDA for OTC derivatives transactions). These clear standards help ensure transactions are fair and secure for all parties involved.

However, in the onchain world, standards like this are few and far between. Today, we see various difficulties such as interoperability and composability (e.g., when two different chains are utilized) or creating standards amongst transacting parties (e.g., an agreement amongst investors, issuers, and users on a standard to transact). To get traditional players more comfortable with credit asset tokenization, standardization is of the utmost importance.

> ***Composability, connectivity, and seamless shared integrations*** *are consistently cited as some of the most appealing features of using and leveraging blockchain technology.*

The Importance of Composability

One of the promises of blockchain technology is the power to create applications that can seamlessly integrate with each other (i.e., composability). The principal value here is in the ability to interconnect and coordinate different applications, built and run by different teams, with minimal trust-assumptions. For industries that seem perpetually doomed to pay for trusted third parties and middlemen, this is an appealing prospect. However, the ability to seamlessly integrate applications and share common data has proven difficult to achieve without further coordination and development – even for applications built on the same blockchain network.

In the early days of Ethereum development, it was obvious that application composability wouldn't be so easily achieved. As early blockchain-enabled developers honed in on financial use cases, the difficulty of each individual developer having to create their own token was quickly understood. It wasn't until the ERC-20 token standard was defined in late 2015, and eventually adopted at scale, that app developers and users started to finally benefit from the composability potential of shared blockchains.

Today, there are hundreds of thousands of ERC-20 smart contracts deployed onto the Ethereum Mainnet, all sharing a common interface and representing the same high-level expected behavior. Composability, connectivity, and seamless shared integrations are consistently cited as some of the most appealing features of using and leveraging blockchain technology. Institutional builders in DeFi should take note – it was not just the underlying technical fabric that enabled the shared capabilities of DeFi, but also the development of processes and best practices that developers and applications could easily adopt to usher in the next wave of institutional adopters.

What Standards Enable: Lessons from Traditional Finance

One of the many examples within traditional financial markets that DeFi can learn from is in the development and eventual impact of the ISDA (International Swaps and Derivatives Association) Master Agreement.

In the mid-'80s, against the backdrop of globalization and maturing financial markets, derivative contracts began to be used more and more. Without clear oversight, the industry of global financial participants was left on its own to deal with the complexities of scaling bespoke and bilateral contracts used around the globe. The subsequently developed association, the ISDA, was formed by industry participants to mutually develop and enforce a standard contract for swaps and derivatives.

The ISDA Master Agreement and its associated components would eventually go on to serve as the backbone of a market that transacts trillions of dollars notionally. And while maintaining a common framework, the ISDA Master

Agreement is capable of supporting a diverse industry with a rich degree of complexity and constructive arrangements within it. ISDA contracts are now used as the common legal and administrative framework that underlies derivative contracts around the world. While the final terms are negotiable – allowing the industry to continue developing, innovating, and adapting to the needs of the market – the Master Agreement serves as the starting point in establishing common behavior in the financial marketplace.

While ISDA was originally just focused on boilerplate documentation standards, the association ultimately is responsible for developing the shared behavior that defines an entire industry. It is largely responsible for the successive scale of global derivatives markets; as far as standards go, it is without a doubt a history lesson that is useful for DeFi.

The development and successful transition to an institutional-quality DeFi industry will require our own industry version of the ISDA.

What can Traditional Market Standards Unlock for Onchain Assets and DeFi?

Tokenized credit assets, often referred to in DeFi as real-world assets (RWAs), cover an incredibly large swath of financial markets and industry domains. Depending on who you ask, an RWA application may deal with assets from structured finance to asset-backed securities to insurance products – or something else entirely. With an almost infinite design space to play in, RWA application developers are left in a similar state as the early days of Ethereum.

To overcome the difficulties associated with this wide range of possibilities, the industry needs to not only adopt token standards, but also develop common and shared practices for the total operation of onchain deals.

Developers and their users need improved token standards that cater to the industries their users work within. For example, platforms like Centrifuge utilize asset-level NFTs – non-fungible tokens that represent the financial collateral in borrowing arrangements. Asset-level NFTs bring unprecedented visibility and verifiable asset data, ultimately supporting audits, ratings, and other third-party

verification and audit services. However, while the NFT itself adheres to the existing NFT token standards, the underlying collateral itself is left non-standard and to the responsibility of each respective issuer to define. Even within the same industry and when relying on existing traditional conventions, financial arrangements related to something like real estate can have vastly differing asset data and behavior captured onchain. A standard that defined the data of underlying assets in RWA projects would help to facilitate scalable compliance policies, usable commercial insights, and enable deep interoperability.

> *To be able to address the fragmented and inefficient marketplaces of credit today, Centrifuge, or any other RWA protocol, must be able to take advantage of the inherent composability of blockchain.*

To complicate matters, the need for standards doesn't stop at assets. As more issuers continue to come onchain, they each bring with them a wide variety of expected behaviors, individual processes, and "standard" ways of doing business. Capturing these behaviors and representing them onchain for upstream and downstream processing can rapidly become a challenge. Third-party providers who provide services such as fund administration, accounting, taxes, audit, and similar functions all need to adapt to the individual and respective processes of these players. Combine the wide variety of participants with novel behavior introduced by blockchains, and you have quite the headache.

To be able to address the fragmented and inefficient marketplaces of credit today, Centrifuge, or any other RWA protocol, must be able to take advantage of the inherent composability of blockchain. Just as accounting standards helped unify the financial reporting in public markets, we should expect that similar record-keeping, business process, and token standards need to be developed or adapted for use into the onchain ecosystem. This is a necessary and sufficient component to make tokenized credit asset transactions work for the institutional investor and issuer. Token standards remain as a key coordination problem within our nascent industry, and require a multiple parties to coalesce and solve for.

Design New Value Chains

To understand the third and final key to unlocking the next stage of growth for tokenized credit assets, let's look at a specific example – **BlockTower Credit**.

With the technologies and platforms available today, BlockTower Credit has been successful in building and deploying a $150+ million structured credit strategy. The first of its kind, this strategy has already demonstrated the promise of a streamlined, onchain credit fund by leveraging many of the advantages of tokenization outlined above. However, there remains a significant opportunity in optimizing institutional investment strategies, by identifying and implementing new credit systems.

While the initial benefits of tokenization are being realized, executing on both existing and emerging credit and payments infrastructure is expensive and inefficient, thus not scalable in the long term. The need for a single, streamlined system is needed to compound the benefits of tokenization across the value chain.

Examining the Current Credit Investing Value Chain

The existing value chain for credit investing remains relatively unchanged – sourcing, underwriting, origination, servicing, etc. However, in imagining an onchain, fully tokenized real-world asset market, several existing middle and back office processes can be streamlined through blockchain technology. Through automation and disintermediation, tokenized assets paired with smart contracts can shorten the distance between borrowers and lenders. With more peer-to-peer like characteristics, existing value chains will need to be reframed to fit the new market infrastructure.

Designing a New Value Chain for Tokenized Credit Investing

The value chain for tokenized credit investing will have similar components to its off-chain counterpart, with certain key differences. This new value chain reimagines the roles of counterparties and end-to-end credit investing practices.

A tokenized credit value chain involves borrowers, lenders, originators, issuers, and servicers all transacting on the same medium or system-of-record. Onchain agents, built into lending platforms, will abstract away the responsibilities traditionally managed by off-chain actors.

With reduced intermediaries, borrowers can connect more directly to lenders and financiers to issuers. Secondary markets can operate akin to existing decentralized exchanges (DEXs), though perhaps using an auction-based mechanic. Structured finance assets can continuously be assembled, disassembled, and re-assembled again to match investor demands. Increased availability of data and reduced information asymmetries can result in new models and capital allocation strategies that lead to more efficient markets and better risk management frameworks.

> *Due to the inherent modularity and composability of onchain platforms, issuers and investors can expect more customized and rapidly developed solutions.*

In the case of MakerDAO, which has provided over $5 billion worth of credit to various depositors in exchange for collateral, institutions like Société Générale and Huntingdon Valley Bank accept that pieces of software deployed on a public blockchain network can enforce parameters like interest rates, custody assets like USDC, and execute transactions like sending assets to specific addresses. Typically, a similar transaction would require counterparties ranging from a Calculation Agent to an Escrow Agent to a Transfer Agent.

In BlockTower's example of accessing term financing through MakerDAO, Centrifuge smart contracts act as the Calculation Agent and Maker smart contracts act as the Escrow Agent, while transfers and transactions are secured by Ethereum. Each new "counterparty" is a snippet of immutable, automated code running on the public blockchain with a current track record of managing over $100 billion in total value at its peak. The reduction in not only operational expenses but also associated counterparty risks have led these onchain systems to be more efficient than traditional finance processes.

The products and platforms that enable this value chain are just starting to come online. Onchain credit platforms are offering solutions that address critical parts of the tokenized asset lifecycle, like participating, financing, and repaying a debt obligation onchain. These processes, reimagined on web3 rails, reduce back-office dependencies, increase auditability, and can lead to more automation than similar traditional finance processes. While significant portions of the value chain, like data aggregation, valuation, and reporting, remain off-chain, onchain investment platforms have opened the door for early adopters to enter and build potentially attractive businesses.

What can New Investor Tools and Value Chain Unlock?

Due to the inherent modularity and composability of onchain platforms, issuers and investors can expect more customized and rapidly developed solutions. Several investment vehicles that would have taken 2-3 years to develop in a monolithic, traditional finance system have and will be deployed in under 1 year using onchain building blocks.

The next wave of innovation requires onboarding not only more real-world assets but also more business processes and tooling found in traditional finance. Integrating data aggregation and analytical tools for tokenized credit assets is essential.

For example, a key component of the credit investing value chain is underwriting and valuation; data-gathering solutions like DV01 can play a significant role here. DV01 ingests, standardizes, and disseminates critical

loan data through modern analytical tools, enabling credit professionals to underwrite effectively. Implemented correctly, tokenized credit assets would naturally contain the necessary metadata to democratize information, in a confidentiality preserving manner, to expand the universe of potential underwriters, and create more efficient markets.

Credit underwriting professionals need sophisticated tools on top of the onchain tokenized assets to manage risks, value assets, and conduct reporting. Without the presence of these tools, larger adoption of tokenized credit assets will remain blocked as allocators will be unable to deploy at scale.

Tokenized assets also require existing traditional finance counterparties to interact with onchain systems in new ways. Though reducing counterparty exposure and costs is a powerful incentive, fully “trustless” systems are extremely rare and difficult to achieve. Disintermediation extends only as far as smart contracts and code can reach without human actors, and human input is always required. With human actors, attributes like instant finality, full non-reversibility, and full transparency may be overextensions of crypto-native principles that need to be amended to work. Therefore, as traditional market participants adjust their behaviors, crypto-native platforms also need to update to accommodate certain realities. With that in mind, there are many opportunities to reimagine the ecosystem actors today and how they can provide inputs into a less centralized, more trustworthy model tomorrow.

BLOCKTOWER

CASE STUDY

BlockTower Credit, using the platforms offered by Fireblocks and Centrifuge, has effectively tokenized $150 million worth of structured credit assets onchain.

This process involved the creation of over 45 asset-level non-fungible tokens (NFTs), each representing a structured credit asset purchased into a fund. The asset-level NFTs and associated tokens are legally secured within a structured vehicle and are subject to third-party verification, bridging onchain transparency with off-chain verification and assurance.

These tokenized assets are more than mere digitized copies of the underlying assets within the portfolio. They represent an innovative financial product, governed by both legal agreements and smart contracts. The process of tokenization has facilitated the efficient operation of a structure akin to a collateralized loan obligation (CLO), which currently accounts for over $150 million in assets. This approach has proven to be cost-efficient with a total expenditure of approximately 5 ETH in gas fees, which is equivalent to less than a basis point in fees at current ETH prices. Centrifuge's deployment of smart contracts has been instrumental in this operation. These contracts execute logic that automates the calculation and distribution of cashflows as per a waterfall model – tasks traditionally performed by a costly network of calculation and escrow agents. This partial transition to onchain management reduces the need for intermediaries, which subsequently lowers both administration costs and counterparty risks. Fireblocks provides the critical non-custodial framework to securely operate with tokenized assets and deploy them into onchain platforms.

BlockTower Credit, in collaboration with Fireblocks and Centrifuge, has demonstrated the potential of tokenization to enhance control, improve operations, and reduce reconciliation associated with operating a credit fund.

Conclusion

Tokenized credit assets have the potential to revolutionize the financial system – offering increased efficiency, transparency, and accessibility. While the journey will not be a linear one, a future state where tokenized credit assets are commonplace is possible.

To enable this future, the broader digital asset community needs to help create those new business models, tokenization standards, and new investor tooling and value chain. There are lessons to be learned from traditional financial markets that should not be ignored.

The usage of tokenized credit assets will be governed by how quickly we can build. With the initial set of use cases already developed, the time to enter the next phase of adoption is now.

ABOUT BLOCKTOWER

BlockTower is an institutional investment firm applying professional trading, venture investing, and credit underwriting across digital and traditional assets. The firm was founded in 2017 by University of Chicago Endowment portfolio manager and Susquehanna International Group trader, Ari Paul, and Goldman Sachs executive and engineer, Matthew Goetz.

ABOUT CENTRIFUGE

Founded in 2017, Centrifuge is the institutional platform for credit onchain. Notable firsts include minting MakerDAO's first real-world asset, structuring the first onchain securitization, launching the RWA Market with Aave and bringing the first credit fund's operations onchain with BlockTower. Centrifuge provides both the infrastructure and ecosystem to tokenize, manage, and invest into a complete, diversified portfolio of real-world assets.

Fireblocks

About Fireblocks

Fireblocks is an enterprise-grade digital asset security platform for moving, storing, and issuing digital assets. Fireblocks enables financial institutions to securely build, run and scale digital asset operations through the Fireblocks Network and MPC-based Wallet Infrastructure.

The company has secured the transfer of over $4 trillion in digital assets and offers a unique insurance policy that covers assets in storage & transit.

To see Fireblocks in action reach out to **sales@fireblocks.com**.
Learn more at **Fireblocks.com**.

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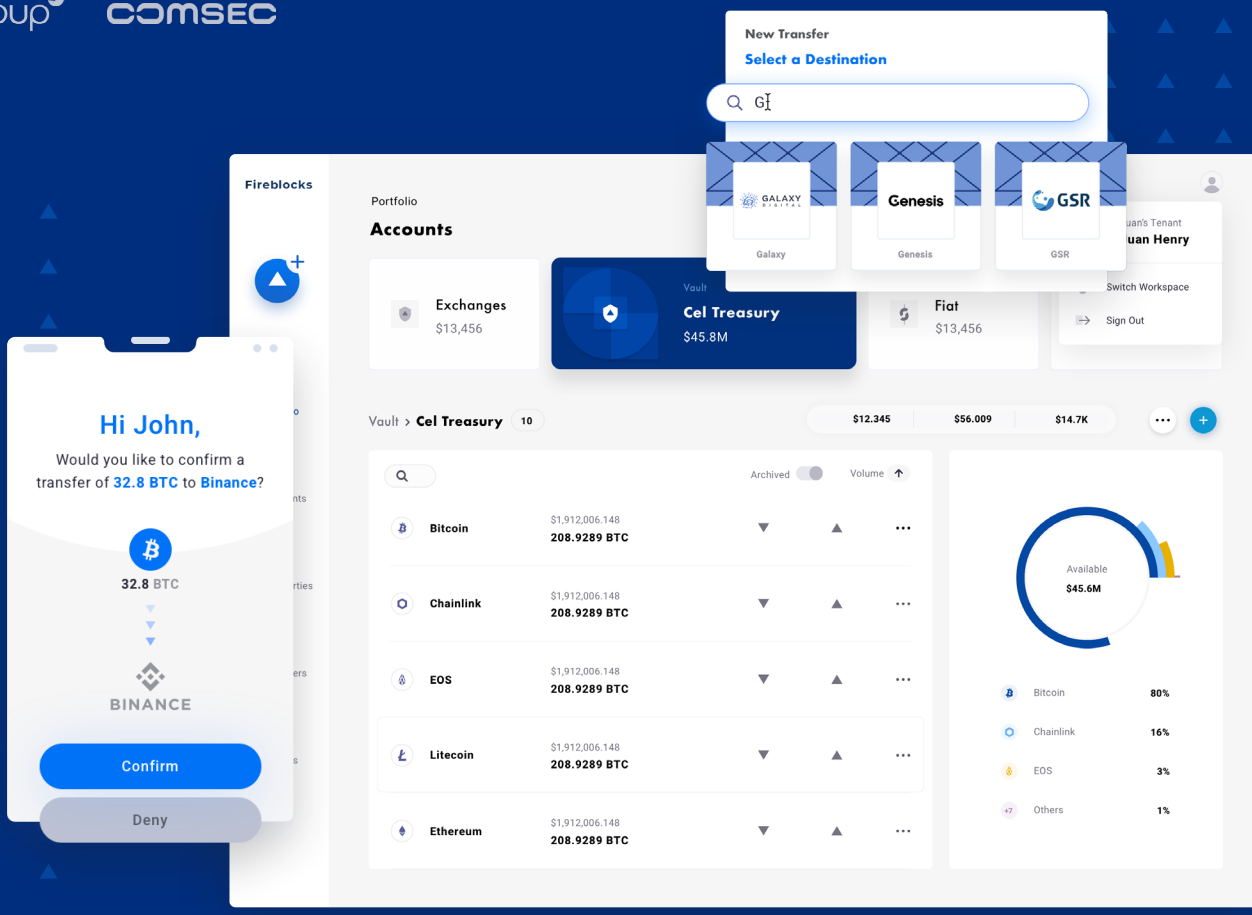

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The authors of this white paper, BlockTower Capital Advisors LP ("BlockTower" or the "Adviser"), Fireblocks, Inc. ("Fireblocks"), and CFG Services, Ltd. ("Centrifuge"), are co-authors and have collaborated on the content presented. Each entity has provided its respective expertise and opinions on the subject matter discussed; however, the views expressed in this white paper are those of the authors and do not necessarily reflect the official position of each entity.

Investing in tokenized credit assets involves various risks, including but not limited to market risk, liquidity risk, regulatory risk, and technological risk. The value of tokenized assets can fluctuate, and investors may incur losses. Past performance is not indicative of future results.

This white paper may contain forward-looking statements that involve known and unknown risks, uncertainties, and other factors that may cause the actual results, performance, or achievements to differ materially from the anticipated results, performance, or achievements expressed or implied by such forward-looking statements.

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It is recommended to seek professional advice and perform thorough due diligence before making any investment or business decisions related to tokenized credit assets or any other financial instruments mentioned in this white paper.

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The description herein of the approach of the Adviser and the targeted characteristics of their strategies and investments is based on current expectations and should not be considered definitive or a guarantee that the approaches, strategies, and investment portfolio will, in fact, possess these characteristics. In addition, the description herein of the risk management strategies of BlockTower Credit (defined below) is based on current expectations and should not be considered definitive or a guarantee that such strategies will reduce all risk. These descriptions are based on information available as of the date of preparation of this document, and the description may change over time. Past performance of these strategies is not necessarily indicative of future results. There is the possibility of loss and all investment involves risk including the loss of principal.

REFERENCES TO BLOCKTOWER CREDIT

As used in this presentation, references to "BlockTower Credit", the "BlockTower Credit Fund" or the "Funds" refers to the mini-master fund structure of (i) BlockTower Credit Partners, LP, a Cayman Islands exempted limited partnership and master fund in the BlockTower Credit Fund structure; (ii) BlockTower Credit Partners Offshore, LP, a Cayman Islands exempted limited partnership and feeder fund (primarily for Non-U.S. and Tax-Exempt investors) in the BlockTower Credit Fund structure; (iii) BlockTower Credit Blocker (KY), Ltd., a

Cayman Islands exempted company and Non-ECI investment blocker for the feeder fund in the BlockTower Credit Fund structure; and (iv) BlockTower Credit Blocker (US), LLC, a Delaware limited liability company and ECI investment blocker for the feeder fund in the BlockTower Credit Fund structure.

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Any projections, forecasts and estimates contained in this document are necessarily speculative in nature and are based upon certain assumptions. In addition, matters they describe are subject to known (and unknown) risks, uncertainties and other unpredictable factors, many of which are beyond the Funds' control. No representations or warranties are made as to the accuracy of such forward-looking statements. It can be expected that some or all of such forward-looking assumptions will not materialize or will vary significantly from actual results. Accordingly, any projections are only estimates and actual results will differ and may vary substantially from the projections or estimates shown.

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DIGITAL ASSET RISKS

The regulation of digital assets is an ongoing area of focus for legislators and regulators and there is no central marketplace for currency exchange, pricing, or validation. Supply of any digital asset is generally determined by a computer code or network administration, not by a central bank, and prices can be extremely volatile relative to more traditional markets. Additionally, such digital asset exchanges often have limited access to liquidity in certain digital assets, follow few, if any uniform frameworks applicable to asset pricing, and may suffer from operational issues, such as delayed execution, that could have an adverse effect on a user. The reliability of such exchanges can be difficult to verify and many digital asset exchanges have been closed due to fraud, failure, security breaches or failure to adhere to regulatory requirements and licensure schemes applicable to their operations. Any digital asset that resides on an exchange that shuts down may be lost.

Several factors may affect the price of digital assets or the value of the debt and/or equity of digital asset companies, including, but not limited to: supply and demand, public and non-public information, investors' expectations with respect to use cases, the rate of inflation, interest rates, currency exchange rates or future regulatory measures (if any) that restrict the trading of digital assets, the use of digital assets as a form of payment, the use of digital assets as collateral to secure debt obligations and the process of perfecting and/or enforcing a security interest in digital assets. There is no assurance that any digital asset will maintain its long-term value in terms of purchasing power in the future, or that there will be sustained demand for the products and services offered by all or certain digital asset companies.

Digital assets are created, issued, transmitted, and stored according to defined protocols designed by various development and offering teams and run by a centralized or decentralized system of computers in the applicable digital asset network. The validity, operation, and surety associated with any protocol or network depends on a number of factors, not the least of which is the source-code and protocol design

upon which it runs. Malicious smart contracts, protocols, and networks increase the risks of transacting in the digital asset and blockchain ecosystem and expose clients to significant risks. Additionally, it is possible these protocols have undiscovered and unintentional flaws which could result in the loss of some or all assets held, whether as collateral or otherwise, by a user. There may also be network scale attacks against these protocols which result in the loss of such assets, including attacks by network participants and developers in the form of forks and control attacks. Some assets held, whether as collateral or otherwise, by a user may be created, issued, or transmitted using experimental or not-yet-validated cryptography methods which could have underlying flaws. Advancements in quantum computing could break the cryptographic rules of protocols which support digital assets.

TRANSACTING ON DIGITAL ASSET NETWORKS

In certain cases, an individual may convert digital assets to or from U.S. dollars or other traditional value or store of value mechanisms which may cause such individual to risk the loss of the value mechanisms to the extent that security mechanisms, controls, and wallet and password hygiene are not maintained applicable to the digital assets purchased. Similarly, an individual may use certain digital assets to purchase other digital assets. Such transactions generally involve specific digital asset networks, or online end-user-to-end-user networks that host a public transaction ledger, known as a blockchain, and the source code that comprises the basis for the cryptographic and algorithmic protocols governing such networks. In many such transactions, the recipient of the digital assets must provide its public key, which serves as a public facing address for a digital wallet, into which assets will be transferred, to the party initiating the transfer. In the data packets distributed from digital asset software programs to confirm transaction activity, the transferring user, the sender of the digital asset, must "sign" the transaction with an output derived from entering the sender's private key, a unique code private to the sender, into a "hashing algorithm," and this signature serves as validation that the transaction has been authorized by the owner of such digital asset. Many digital asset exchanges and other providers have been closed due to fraud, failure or security breaches and certain other actions taken while using the exchange or provider services. In many of these instances, the customers of such digital asset exchanges were not compensated or made whole for the partial or complete losses of their account balances in such digital asset exchanges or service provider accounts or wallets. Additionally, users of digital asset exchanges and other digital asset products are often subject to "phishing" scams, where hackers use communication channels to fraudulently obtained account credentials and private keys to perpetuated large-scale thefts of users' digital assets. Due to these security and wallet control risk factors for theft, fraud, and account and wallet access issues, a client's digital assets collateral or assets, as well as the digital wallets associated with such collateral or assets, may be subject to loss or theft.

NASCENT DEVELOPMENT OF SMART CONTRACTS

The nascent nature of smart contract development may magnify initial problems, increase volatility and reduce interest in smart contracts, which could have an adverse impact on the value of Ethereum, Solana, certain DeFi protocols, or other digital assets, as well as certain digital asset companies. Smart contracts are computer protocols that facilitate the negotiation or performance of certain contractual terms or events and have only very recently been implemented in the digital asset landscape. Since smart contracts typically cannot be stopped or reversed, bugs or fraud in their programming and design can have catastrophic effects.

Smart contracts are integral to many decentralized finance activities, and therefore such decentralized finance activities are subject to risks related to errors, bugs, or other vulnerabilities and problems with the development and deployment of smart contracts.

DECENTRALIZED FINANCE ("DEFI") RISKS

DeFi refers to a variety of blockchain-based applications or protocols that provide for peer-to-peer financial services using smart contracts and other technology rather than such services being offered by central intermediaries. Common DeFi applications include borrowing/lending Digital Assets and providing liquidity or market making in Digital Assets. Because DeFi applications rely on smart contracts, any errors, bugs, or vulnerabilities in smart contracts used in connection with DeFi activities may adversely affect such activities. DeFi lending is subject to counterparty risk and credit risk, but because lending is automated through the DeFi protocol, such risks may be exacerbated, particularly if there are flaws in DeFi protocol's code or operation. DeFi applications may involve regulated financial products or regulated activities, however because of their decentralized nature, there is generally no entity subject to regulatory supervision. Accordingly, the use of DeFi applications may be subject to more risks than engaging in similar activities through regulated financial intermediaries. In addition, in certain decentralized protocols, it may be difficult or impossible to verify the identity of a transaction counterparty necessary to comply with any applicable anti-money laundering, countering the financing of terrorism, or sanctions regulations or controls.

ATTACKS ON DECENTRALIZED APPLICATIONS

The complexity and interconnectedness of digital asset networks, applications, and economic systems enables new forms of malicious attacks that leverage a feature or vulnerability of one system to attack another. Such an attack may take the form of a temporary manipulation of the price of certain digital assets that trigger second order behaviors, such as automatic collateral liquidations on decentralized applications or Digital Asset trading platforms. A malicious actor can exploit the structure of one or a series of smart contracts or applications in ways that do not technically constitute exploitation of a "bug" or flaw in the smart contract or application. For example, such an exploit has occurred repeatedly in the Ethereum DeFi ecosystem, whereby a decentralized exchange or lending application is designed to reference an external pricing source of a particular digital asset to determine when to liquidate collateral. By manipulating the price of the particular digital asset on a third-party platform (such as a digital asset trading platform), the pricing source used by the decentralized trading platform or application is consequently manipulated, which then leads to uneconomic collateral liquidations on the decentralized trading platform or application. Such liquidations may be processed automatically and could have a material adverse effect on a user.

RISKS RELATED TO NONFUNGIBLE TOKENS (NFTS)

NFTs are unique, one-of-a-kind digital assets made possible by certain digital asset network protocols. Because of their non-fungible nature, NFTs introduce digital scarcity and have become popular as online "collectibles," similar to physical rare collectible items, such as trading cards or art. Like real-world collectibles, the value of NFTs may be prone to "boom and bust" cycles as popularity increases and subsequently subsides. Certain metadata pertaining to NFTs may be stored "offchain," i.e., not on a decentralized digital asset network and as a result the NFT, instead of a representation of value, may be an indication of title or ownership for the off-chain object. If the entity behind an NFT project ceases hosting relevant metadata relating to NFTs, such NFTs may become worthless. If any of these events were to occur, it could adversely affect a holder's investment. In addition, because NFTs generally rely on the same types of underlying technologies as digital assets, most risks applicable to digital assets (including phishing, hacking, blockchain risks) are also applicable to NFTs and hence any investment into NFTs will be subject to general digital assets risks.

DECENTRALIZED TRADING PLATFORMS

Decentralized trading platforms may be implemented in a variety of manners, including some that are purely technical (e.g., based on smart contracts) or others that require substantial intervention by one or

several parties (to perform verifications of parts of the transaction) and they generally facilitate direct trades between participants using software protocol without the use of a third party to provide a custodian for some or all of the assets involved in the transaction. Decentralized trading platforms present risks that are different than those associated with using a centralized exchange. As with any digital asset trading platform, decentralized trading platforms may include bugs that expose a user's digital assets to the risk of being lost or stolen. Flaws in the protocols or structure of such exchanges may expose trading information of a user in a manner that allows other entities or individuals to front-run a user's orders or transactions or otherwise cause harm to, or profit at the expense of, a user.

Decentralized exchanges may be created in part to avoid potential regulation and to mask the identity of participants. As such, decentralized trading platforms may attract bad actors. Accordingly, compared to centralized digital asset trading platforms, there may be an increased counterparty risk and increased risk of theft, fraud or loss when using such an exchange, and compliance with laws and regulations relating to AML/CFT, sanctions and export controls may be difficult or in some cases, impossible. Due diligence on decentralized trading platforms may be limited insofar as there may be no intermediary organization to subject to such diligence—only the trading platform itself, its protocols and, to the extent such information is available, the persons responsible for developing the trading platform. The decentralization of a trading platform and the lack of regulation means that there is no intermediary or regulator from which one might seek recourse or remedy in the event of any disruptions in the expected performance of such trading platforms.

Decentralized trading platforms and the lack of a central custodian responsible for security and maintaining the protocols on which the trading platform operates may make them easier targets and potentially increase the risk of cyberattacks and manipulation. Currently, decentralized trading platforms generally offer limited functionality as compared to centralized exchanges, often including an inability to accommodate certain order types (e.g. limit orders) or transaction types (e.g., inter-chain trading or converting digital assets to fiat currency). Decentralized trading platforms also currently suffer from limited trade volume, which can be expected to reduce the liquidity of the assets traded on the trading platform and the ability of a client to exchange assets thereon.

REGULATORY STATUS

BlockTower Capital Advisors LP is a registered investment advisor with the U.S. Securities and Exchange Commission ("SEC"); registration with the SEC does not imply that the SEC has reviewed the materials herein nor does it denote any level of qualification pertaining to the Adviser's investment vehicles.