2022 Cryptocurrency Review

By David Struthers, Daniel Hilhorst & Francois Botha

Family offices have distinct needs and considerations when evaluating gaining exposure to cryptocurrency. This review examines the technology underlying cryptocurrency, the ecosystem of service providers with special attention to crypto custodians, and common strategies within this growing and dynamic space.

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1. Introduction

Cryptocurrencies and other digital assets dramatically pushed toward the mainstream in recent years. Family offices, like institutional investors, have distinct needs when considering gaining exposure to digital assets. The evolving regulatory environment, volatility, and unique characteristics of this new asset class require careful consideration and risk management.

Family offices vary in their internal technological, operational, and infrastructure capacity. They also vary in risk preference, drawdown tolerance, and compliance needs. The distinct pathways of FOs into cryptocurrency and their points of contact with sector stakeholders will grow from internal assessments along these lines, and, like always, stay focused on the investment's purpose and goals. An ecosystem of service providers has grown to bring the digital asset sector an increased level of maturity to support adoption by family offices, high net worth individuals, and institutional investors.

The depth of internal capacity in cryptocurrency may see an FO reaching out to full-service custody providers or maintaining self-hosted crypto wallets. Differing risk tolerance may see FOs primarily using yield generating stable coins as a short-term treasury management tool or betting on individual tokens. They may also seek out other opportunities for exposure, away from purchasing coins, including crypto-focused investment funds and ETFs, investing in underlying blockchain technologies, and investing in cryptocurrency service providers. There are many direct and indirect ways to gain the desired exposure in this dynamic and growing space.

The 2022 cryptocurrency review charts the landscape of this asset class and service providers from the perspective of family offices.

"Think of cryptocurrency first as a technology and then an asset class."

– Chris Harmse, BVNK

2. Cryptocurrency

In 2008, while most family offices were deeply focused on navigating their way through the global financial turmoil, a white paper appeared outlining a novel peer to peer financial transfer method. The Bitcoin paper proposed a distributed ledger system to cut banks and other third parties out of their role as facilitators and intermediaries in financial transactions. Bitcoin's first block, the genesis block, was mined the following year making it the world's first blockchain and digital currency. Bitcoin's value has grown exponentially over the last decade as has the number of cryptocurrencies and other blockchain applications.

Over the last few years, digital assets moved from the fringe to somewhere near the mainstream. The novel nature and winding path to broader adoption of this asset class have generated significant media attention for its hype, hacks, personalities, and volatility. Throughout this course, an ecosystem of service providers has steadily grown to bring the sector an increased level of maturity to support adoption by family offices, high net worth individuals, and institutional investors.

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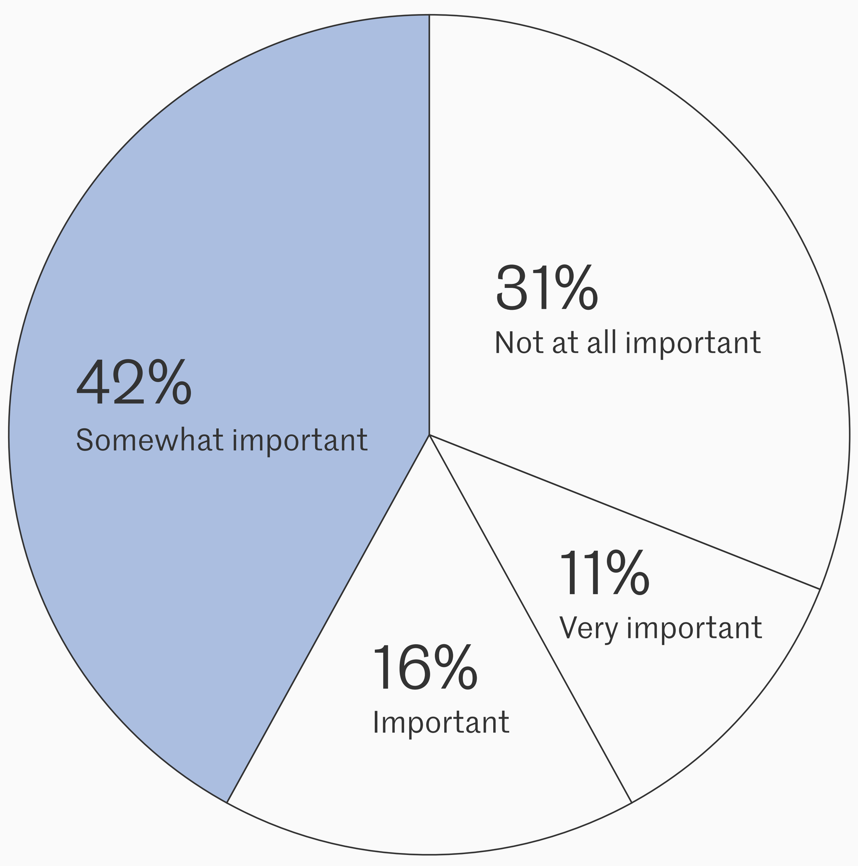
Importance of cryptocurrency to family office investment strategy



Source: BNY Mellon's Shifting Horizons Report (2022)

Understanding the function of the underlying technologies is crucial for family offices to make the right decisions about their approach to this asset class. Retail investors need little more than a phone, a downloaded app, and a bank account to start trading. They can be up and running, purchasing and trading cryptocurrencies with about as much effort as signing up with a ridesharing app. Cryptocurrency exchanges with app-based interfaces eased entry into this asset class for millions of people globally.

Family offices, like institutional investors, have distinct needs and opportunities throughout the value-creating nodes of the ecosystem. This review will explore these opportunities from the ground up, building from purchasing and storing cryptocurrency before identifying common strategies in this space.

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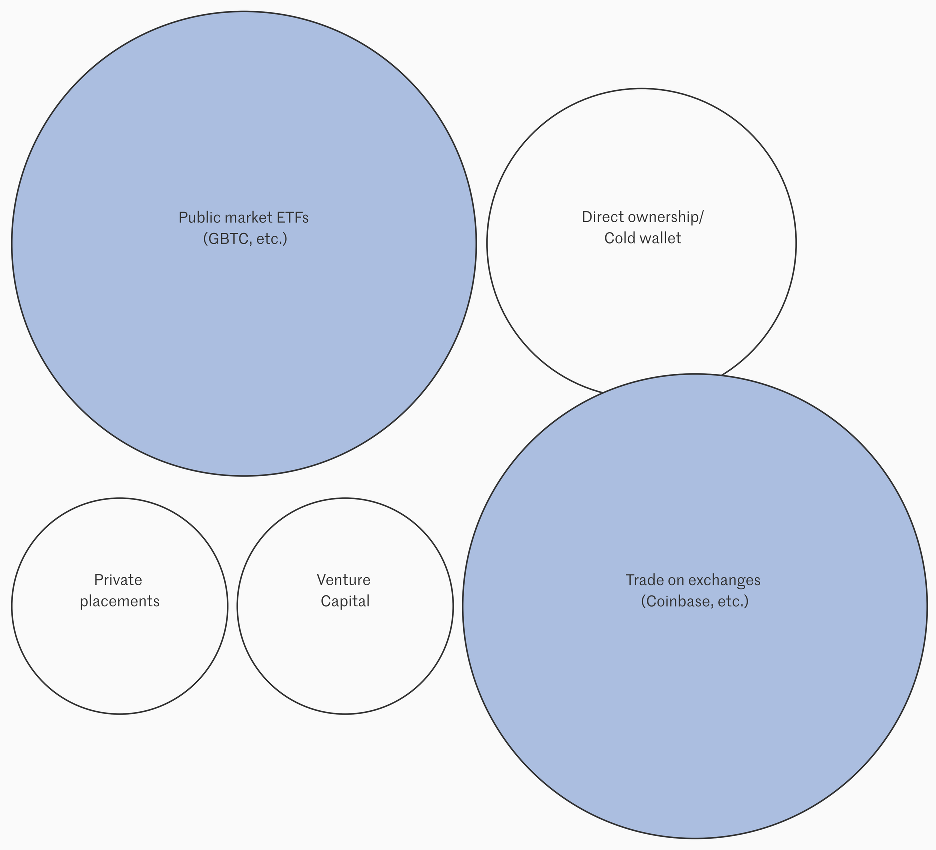

Source: BNY Mellon's Shifting Horizons Report (2022)

Family Offices and Cryptocurrency

Readers should note that this review takes an agnostic approach to the benefit of family offices diversifying into cryptocurrencies. Risk and volatility are high as are the environmental consequences brought by the intense energy use of cryptocurrency transactions in their current state. Crypto supporters critique arguments about energy use and it has potential solutions in energy-efficient chips, creative use of co-located crypto mining operations, and changes in blockchain protocols. Questions of volatility and risk are more open-ended. Rather, the review focuses on describing the landscape of service providers and opportunities in this developing market.

Family offices have a range of opportunities to gain exposure to the crypto space. According to a recent survey of family offices around the world, 15% of respondents currently have crypto exposure and half of the remaining offices are evaluating their opportunities. Those that viewed cryptocurrency favourably saw it as one potential strategy to address high inflation. Significant percentages of family offices without current exposure were sceptical of cryptocurrency being a good store of value.

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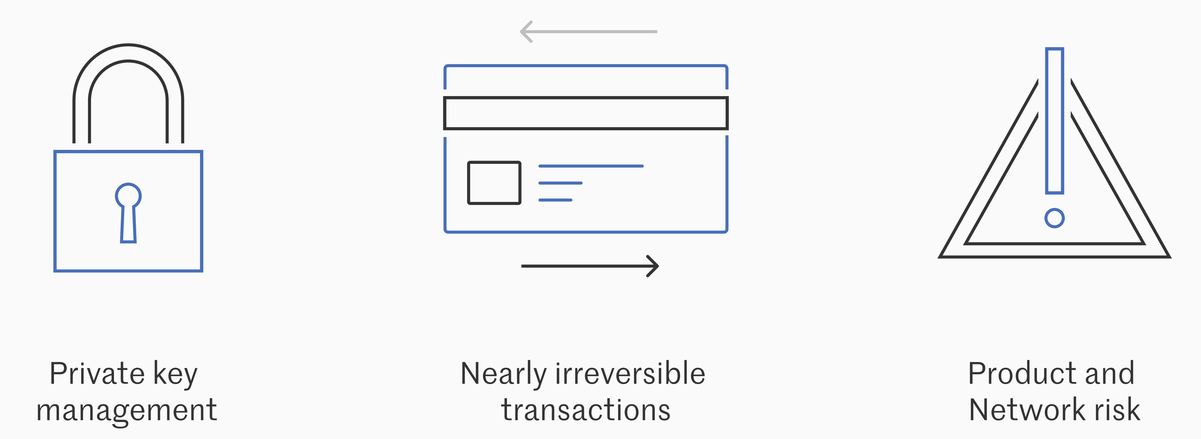
Unique risks of digital assets



Source: theblockcrypto.com

The foundation of any family office venture into the crypto space should be based on education, quality partnerships, and due diligence.

3. Crypto Pathways: Understanding the Asset

Wallets and Exchanges

After finalising the decision to purchase cryptocurrency, family offices need a path to on-ramp fiat currency, complete transactions, and a place to store their new asset. Crypto wallets and exchanges facilitate cryptocurrency transactions. Crypto wallets, like their analogue namesake, hold cryptocurrencies. The only way to acquire Bitcoin during its early years was through mining it or trading it directly with peers that owned it. The peer-to-peer framework of the blockchain underlying cryptocurrencies initially required non-custodial wallets that cut out third-party intermediaries to give asset owners full control and responsibility for their cryptocurrency holdings.

> "Cryptomarkets are a worthwhile long-term investment, but only with proper exposure management and a clear investment thesis."
>
> – Thomas Brand, Coinmotion

The growing interest in digital assets spawned businesses facilitating the exchange of cryptocurrencies and other assets. Crypto exchanges and brokers allow investors to deposit fiat currency in order to purchase and then trade and sell cryptocurrency. Most retail investors use custodial exchange platforms where the company establishes hosted wallets for end users.

Early exchanges were unregulated and insecure, falling victim to hackers and generating bad publicity because of illicit trade facilitated by the anonymous transfer of funds. Shaking off these growing pains, exchanges moved dramatically forward regarding security and regulatory compliance in the last decade. As exchanges grew, they held increasing amounts of clients' coins, which expanded their role as custodians and in providing market liquidity to facilitate trading.

Family offices and institutional investors face heightened regulation, due diligence, and demand for higher security than retail investors. Specialised crypto custodians enter the market to fill these needs by providing the infrastructure to securely store significant cryptocurrency assets. The consistent point is that all cryptocurrency is stored in digital wallets.

Wallets are either "hot" or "cold." Hot wallets are constantly connected to the internet, while cold wallets are disconnected from the internet. There is perhaps some irony in the fact that the safest place to store digital assets is by disconnecting them from the internet in cold wallets. Wallets hosted by exchanges are most often hot, providing ease of use for trading and other activities. Holders of significant cryptocurrency assets typically use cold wallets to add additional security from hackers and other risks. Most custodians, discussed in detail below, utilise a variety of cold storage methods that combine analogue and digital solutions to maximise security.

A quick dive into the cryptography supporting cryptocurrency helps explain the security solutions offered by custodians.

> "Always make sure to understand the security measures in place to store digital assets."
>
> – Carla Bünger, KORE Technologies

Public and Private Keys

Public and private keys work together to verify cryptocurrency transactions through public-key cryptography (PKC). PKC relies on mathematical functions that are easy to solve in one direction, but nearly impossible to solve in the other. For this reason, PKC is often referred to as trapdoor encryption; once you fall through you can't escape. A public key, a long alphanumeric series, is created and known to everyone. The public key is then used to encrypt communications that can only be decrypted or solved by using a private key known only by the recipient.

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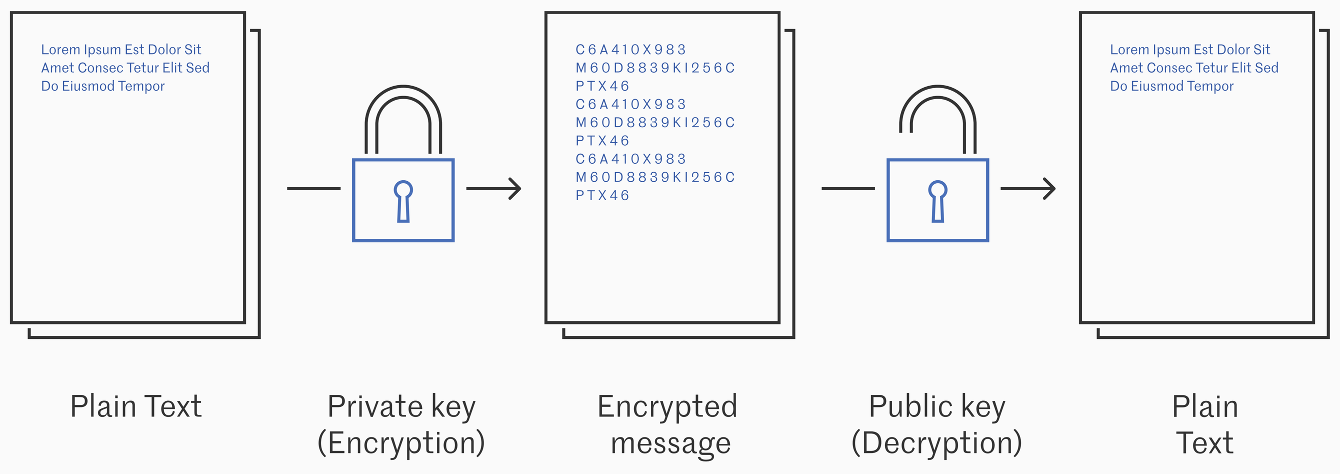
Public and Private Keys



Source: okta.com

Bitcoin uses a particular type of PKC, elliptic curve cryptography, that follows these basic principles, but offers advantages in key size and security. The maths behind these principles is as elegant as it is complicated.

However, it is crucial to understand the importance of the private key to cryptocurrency security to fully grasp the value proposition of crypto custodians. Both public and private keys control access to cryptocurrency. An owner of a digital wallet uses their private key to access their holdings. If an asset owner forgets the alphanumeric series or if a hardware key, often in the form of a USB drive, is lost or damaged, they will be unable to access their wallet. People have lost millions this way.

> "The biggest concern that family offices have is about custody: "Where should my family office store our bitcoin?"

– Andrew Howard, Bitcoin Reserve

Custodians: institutional-grade custody solutions

The founding ideal of cryptocurrency rested in decentralisation. Yet the software code that allows for the decentralised holding of wealth in a self-hosted wallet also creates multiple points of potential failure from hardware to human. Custodians seek to alleviate these risks, especially for large holders and institutions, while also facilitating opportunities beyond storage. This article provides a fascinating look into crypto cold storage balancing physical, digital, and human points of failure.

Comparisons to traditional brick and mortar banks or brokerage firms help describe crypto custodians. Like banks, crypto custodians securely hold assets for clients with some providing add on services. Cryptocurrency custody solutions are based on private keys, rather than physical vaults. Some custodians take control of the private keys of clients, while others may offer technology that leaves owners in control of their private keys.

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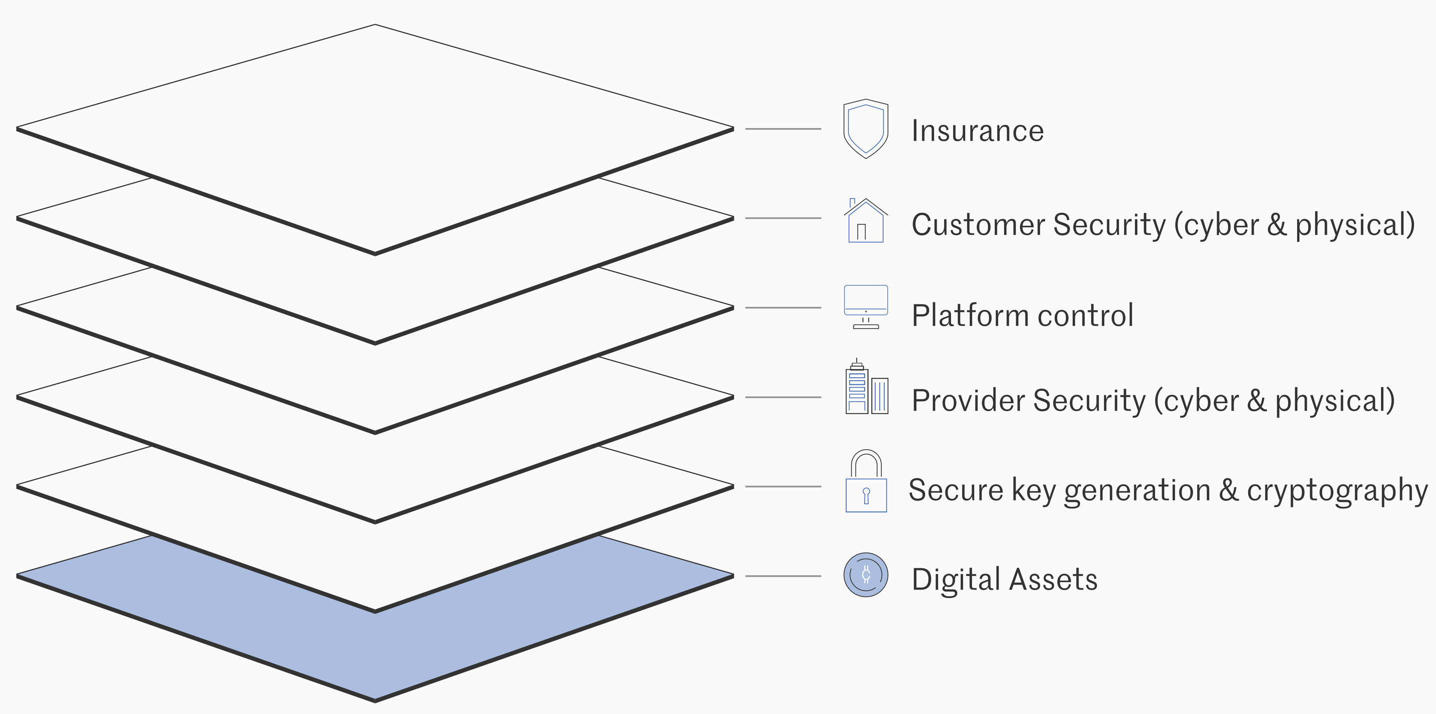
Layers to securing digital assets for institutions



Source: theblockcrypto.com

BLOCKDATA helpfully categorises crypto custodians into three primary types: custodians, technology service providers, and hybrid custodians.

- **Custodians** are third-party entities that store and manage customers' assets.
- **Technology service providers** furnish clients with the technology to build their own custody solutions.
- **Hybrid custody providers** combine elements of the first two categories.

Each type of provider will meet the distinct needs of family offices with varying complexities of digital asset holdings and in-house technological capabilities. Family offices will turn to these service providers to secure their assets from theft, fraud, and, possibly, to secure yield opportunities. Custody providers themselves are also a leading investment opportunity in the cryptocurrency platform space.

One reason why security is of such concern with cryptocurrency is that, unlike traditional wire transfers between banks, crypto transactions are irreversible.

> "Family offices need to consider access to markets via good liquidity providers and exchange platforms, as well as secure environments for digital asset storage."
>
> – Marc Dominic, Co-founder & CTO, Bitcashier

> "There is no reason that in 2022, family offices shouldn't be holding their own bitcoin. Several companies have made it frictionless for family offices to store the bitcoin themselves"
>
> – Andrew Howard, Bitcoin Reserve

The Simple take is that the three most important factors to consider for family offices looking for custody providers are regulation, insurance, and tie-ins with additional financial services. These three features combine to offer maximum security and benefit from digital assets.

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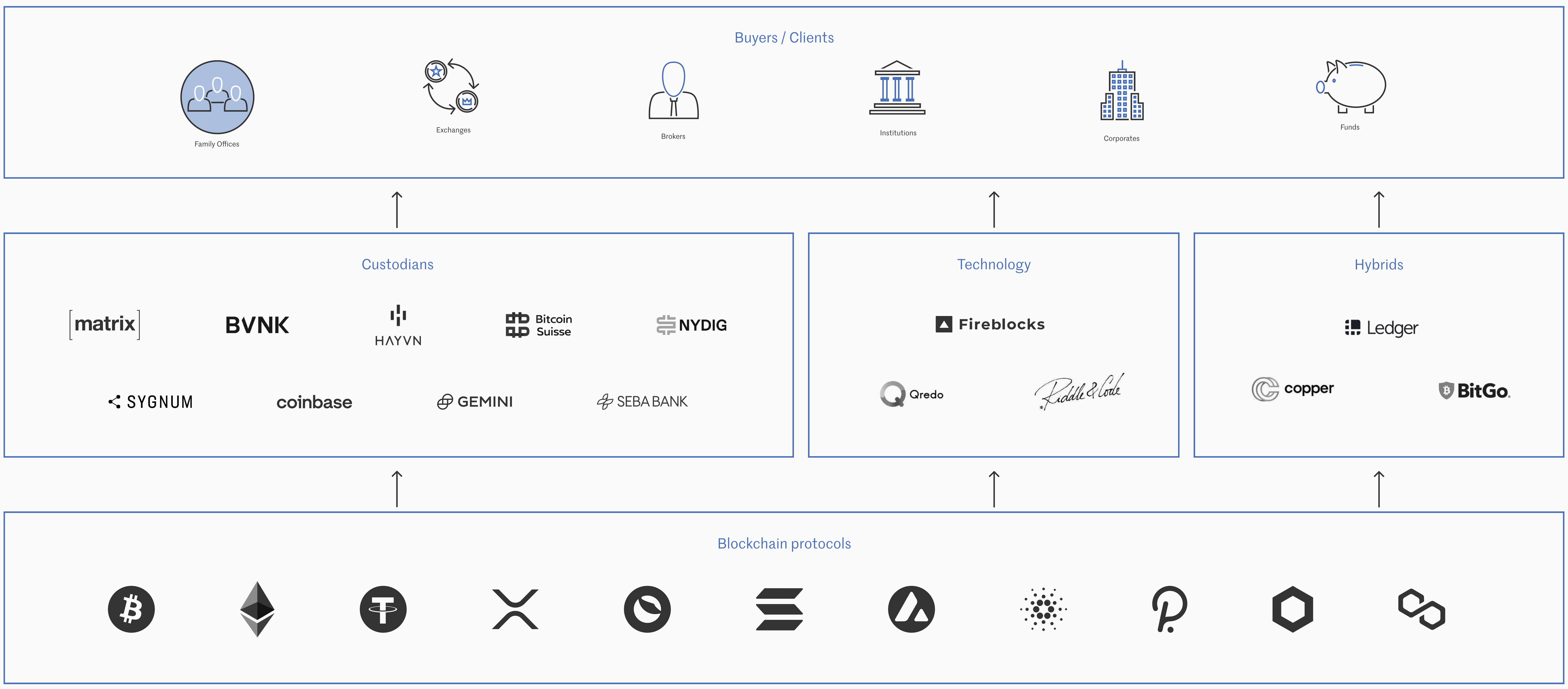

Source: theblockcrypto.com

Regulation

Regulatory regimes and requirements are most often determined by location. In the United States, qualified custodians are regulated as investment advisors by the SEC, in Switzerland FINMA regulations extend to crypto custodians, and Germany's BaFin regulates custodians. Two examples are Coinbase Custody, regulated as a New York state-chartered trust and a qualified custodian under the Advisers Act, and Bitcoin Suisse, regulated as a financial intermediary under Swiss law (VQF and SRO). Additionally, regulated custodians are subject to regular audits as stipulated by the laws of their jurisdiction.

A recent survey of institutional investors and wealth managers found a significant majority concerned about the security of digital assets preventing their investing in the sector. This concern can be alleviated by relying on custodians and the expansion of clear regulation of this asset by national and international bodies.

Additionally, regulatory requirements often extend to fiduciary agents such as multi-family offices. Regulated custodians help investors meet their own regulatory requirements thereby reducing the operational complexity for wealth owners and managers.

Insurance

It would be unwise to view risk mitigation as solely a technological issue. Family offices considering regulated custodians for their digital assets should look at the insurance offered for their deposits. Most of the large custodians and some of the technology service providers and hybrid providers offer insurance. Insurance in the

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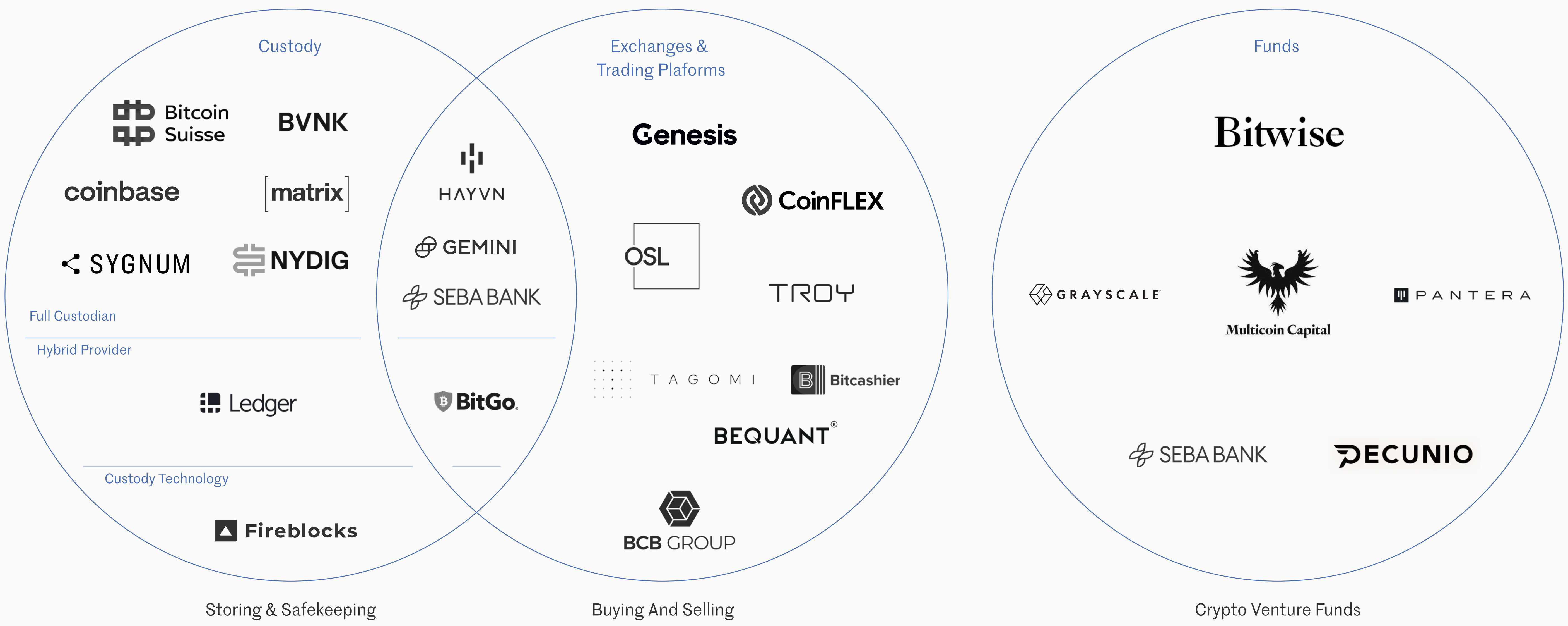
Key Cryptocurrency Service Providers



Source: adapted from blockdata.tech

> "The industry is still new, and new outfits spring up daily. The classic values of working with reputable and well-capitalised providers apply in full force in crypto."
>
> – Jonas Nielsen, Qredo

industry is often organised by custodians working closely with underwriters to outline their physical and human security measures for this new asset class. For example, Coinbase's coverage is underwritten by Aon, a broker for Lloyd's of London syndicates. Their coverage is constructed out of multiple partners in a tower with a predetermined order of loss for each partner.

An important issue arises when considering the type of insurance coverage that crypto custodians offer given the historic volatility of cryptocurrency. If insurance policies for cryptocurrency assets are denominated and secured in fiat currency, custodians will have difficulty increasing their coverage limits to match price increases in an expanding cryptocurrency market. This risk can be mitigated if insurance providers hold some of their assets in cryptocurrency matching the assets being insured. This is an example of cryptocurrency price volatility filtering out into the ecosystem beyond fluctuations in token price.

Cryptocurrency Financial Services

Ownership and the appropriate custody solution are pathways toward entering cryptocurrency markets. The most common strategies involve working with intermediaries to generate yield. There are three primary yield opportunities among a broader range of strategies. The first yield model takes a form similar to traditional finance markets consisting of margin lending and loans collateralised with cryptocurrency to access fiat currency to finance mining operations. The second approach is using one's holdings to "stake" proof of stake (PoS) cryptocurrencies for variable lengths of time and defined yield. The third approach is yield farming through DeFi applications. Other strategies include arbitrage and insurance cover pool supply.

Centralised Finance

Traditional finance has made inroads into the crypto sphere. Currently, their operations concentrate on margin lending to facilitate market neutral trades and to finance mining. Mining operations need fiat currency to buy the hardware for their operations.

Firms offering services in cryptocurrency, from insurance to credit, need to hold significant assets in the cryptocurrency of service as a hedge against the volatility of the asset class. This also leads the firms to serve as crypto custodians. BNY Mellon and US Bank announced in 2021 that they were moving into the custody market, a signal that they were taking initial steps into the crypto loan market.

Crypto credit is about facilitating institutional trading strategies. Currently, the firms offering credit require collateral in crypto, often far exceeding the loan amount to guard against volatility.

> "Strategies can generate significant returns with near-zero volatility and no correlation to other asset classes. Since the risk management and the operations for such strategies are quite complex, investment vehicles are evolving that take care of all these complexities while bringing everything together in traditional, regulatory compliant instruments."
>
> – Thomas Faber, Rudy Capital

Staking

Proof of Work and Proof of Stake are the two dominant

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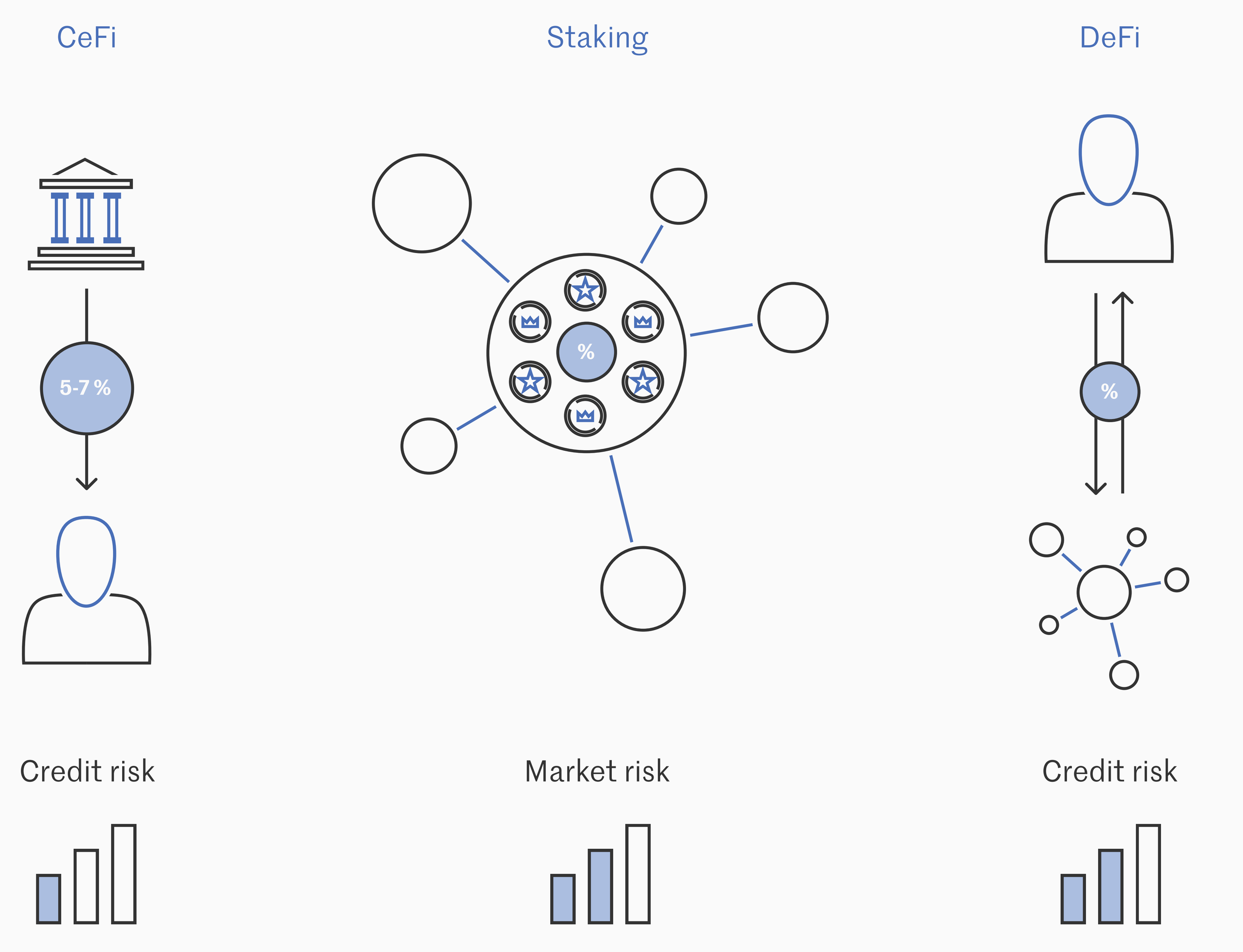
Three types of crypto yield



Source: adapted from blockdata.tech

cryptocurrency validation protocols. The first blockchains developed the proof of work system of validation. The decentralised networks rely on nodes of powerful computers competing to solve complex computational problems to validate transactions. The winner is rewarded by creating the next block in the blockchain and with a small amount of the cryptocurrency being exchanged. This method ensures accuracy and counters fraud. The process of competing to solve cryptographic puzzles is called mining.

Proof of Stake (PoS) protocols work on a different principle. Each new transaction needs to be validated in order to be added to a block in cryptocurrencies based on proof of stake. Staking is a way of using the currency that you own to support the validation of new transactions. Owners can choose to commit their coins to a pool of potential validators chosen at random out of the pool. They give up the opportunity to immediately use their coins in exchange for a monetary reward. Proof of work protocols relies on a computationally burdensome process to validate transactions, whereas proof of stake protocols require potential validators to offer their coins to prove their stake in the network to incentivize the security of the blockchain. This requires less energy in the validation process and opens the possibility of earning passive income from PoS cryptocurrency holdings.

Many crypto custodians and brokers offer staking services for account holders. Rewards and the time length of the lock-up period vary according to the currency being staked and the custodian.

Yield Farming

Another strategy is to provide liquidity to decentralised exchanges in exchange for being rewarded with a defined rate of return. This can occur with the launch of a new DeFi application and the need to have sufficient liquidity at the start to ensure its functionality. Another benefit can bring governance rights to a new token through staking and early engagement with the platform.

Prime Brokerages

Cryptocurrency prime brokers are market intermediaries that facilitate cryptocurrency transactions and other services, similar to brokerage firms in traditional markets. The difference is the services they offer. There is some crossover between brokers and custodians as accessing broker services requires deposits of cryptocurrency assets with their firm, and some brokers offer stand-alone custody solutions. Brokers may also hold significant assets to provide liquidity for the transactions they facilitate. Cryptocurrency brokers make OTC trades through their network. Family offices will most likely choose brokers and custodians over the exchanges geared toward retail investors, unlocking an array of strategies for their holdings. Brokers can provide unified solutions including secure

> "I don't see crypto as radically changing the monetary game—there are remarkable innovations that allow people to transact quicker and easier than ever, but the nature of the transactions is still the same."
>
> – Family Office Principal

storage, access to trading, and yield opportunities through lending and staking. Brokers also often meet regulatory requirements appropriate for their jurisdiction.

Fund Managers and ETFs

Crypto and blockchain investment fund managers have constructed an array of products targeted at family offices, HNWIs, and institutional investors. One key distinction of funds is that they provide exposure to this asset class without investors needing to take on the burden, responsibility, or risk of custody for their digital assets.

Most fund managers offer an array of funds with different minimum investments, fee structures, and liquidity schedules. Strategies can include passive or active management of cryptocurrencies, venture-style investments in early-stage protocols, venture funding in companies in the crypto/blockchain space, and arbitrage. Investor due diligence in these products resembles that of traditional funds and can potentially allow for diversified exposure to digital assets.

Funds are also some of the biggest players investing in underlying infrastructure and service providers. For example, Fireblocks raised $550m in its latest funding round to reach a valuation of $8bn.

ETFs are a separate opportunity. They can offer a similar reduction of the burden of directly investing in crypto assets as funds. The first Bitcoin-linked ETF began trading in autumn 2021. US regulators have yet to approve an ETF that directly invests in digital currencies, but several ETFs construct portfolios that seek to capture the growth of blockchain technology and cryptocurrencies.

4. Conclusion

Probably the single biggest difficulty of investigating cryptocurrency for family offices is the sheer quantity of noise and hype. Some of the noise is generated through marketing and branding as startups compete in this dynamic and growing market. Other voices in the discussion include true believers in the revolutionary potential of Bitcoin and its proof of work blockchain on the global financial system and critics who view cryptocurrencies as nothing more than a pyramid scheme. Filtering through the ocean of information requires a clear understanding of the underlying technology and the value propositions of service providers.