EFFECTIVE EXPOSURE TO CRYPTO VIA DERIVATIVES
AN OPPORTUNITY TO ADOPT CAPITAL EFFICIENCY TRADING and SETTLEMENT MODELS

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The hunt for yield is on. Given the return potential of Crypto Currencies [CCs], it is no surprise that institutional investors are keen to have exposure to Crypto — in particular, the leading coins BTC and ETH. The challenge: spot is a no-go for most Systemically Important Financial Institution [SIFI] for the time being.

Moreover, existing exposure instruments are often modelled on traditional structures. As a result they do not account for the continuous 24/7, 365 days requirements of Crypto assets, nor do they adequately reflect the risk return and payoff structure of underlying CCs — i.e., the tracking error and costs tend to be high. Furthermore, the lack of capital efficient instruments and market structure models is a major impediment towards broader adoption.

Nevertheless, exposure to Crypto can be achieved in a number of different ways [i.e., via TRADFI, DEFI/ Decentralized Exchanges [DEXs] and through various synthetic approaches]. These options are available and take into account different combinations of capital requirements [i.e., margin, balance sheet, regulatory capital] embedded in various financial instruments, legal wrappers, governance and regulatory constellations.

This paper outlines the current options open to institutional investors to gain exposure to CCs and explores considerations for a Digital Market Infrastructure [DMI] provider contemplating offering "institutional grade" solutions. In particular, we look at how existing infrastructure [Centralized Exchange [CEX]/ Central Limit Order Book [CLOB]] can be leveraged to provide Crypto derivatives under the current product regime [listed Futures], versus using new emerging infrastructure [DEX/ DEFI] to develop Crypto exposure products [perpetual swaps, synthetics, and Automated Market Maker [AMM] liquidity pools], taking into consideration regulatory [i.e., initial margin, at both individual security and portfolio level] and compliance requirements across major capital jurisdictions. Finally, we pose the question of whether the emerging pressure on large Financial Institutions to provide digital asset exposure to their clients creates an opportunity to develop novel business models and ultimately create incremental revenue?

The robustness and value of the exchange and clearing house model are well understood in meeting the core principles of stability, maintaining an orderly market structure, and protecting investors. The model offers a fine-tuned "machine" across the global capital markets value chain, including exchanges, Central Counterparty Clearing Houses [CCPs] and Futures Commission Merchants [FCMs]. Automation of execution to clear flows is highly standardized due to broad industry adoption of API connectivity solutions such as FIX protocols and the use of common industry wide adopted software solutions used for "downstream" [back office] processing. This robustness, built around multi-layered infrastructure and indirect investor access, results, in a costly business model with charges that are both directly and indirectly passed on to investors.
Research suggests that for Institutional Investors \( \text{II} \), the familiarity of systems, the ability to meet strict regulatory requirements and the reliability of technology [so called “uptime”] drive adoption decisions. However, latency, depth of liquidity, tight spreads, plus a low-cost base \( \text{i.e., regulatory capital requirements, technology, and operating cost, as well as direct fees} \) are also key determining factors. Whilst the existing models and frameworks score well on the infrastructure side, arguably, some of the new digital asset venues are proving extremely attractive to address some of the thornier issues that revolve around capital-efficient trading models.

Below we evaluate five categories across the existing exchange and clearing house model and compare how these perform in the context of alternative/ emerging digital asset venues.

### MARKET OBSERVATIONS — AN EMERGING PICTURE

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### 1. DERIVATIVE CONTRACT TYPE

Regulated Exchanges \( \text{REs} \) focus on listing fixed expiry futures contracts, whereas new CCs venues also provide liquidity via alternative structures such as Perpetual Swaps\(^2\). It could be argued that a perpetual swap, without fixed expiry dates, is a closer benchmark to track the spot market and a lighter touch investment model removing price convergence, as it eliminates the need to roll or rebalance the portfolio that is required with a fixed expiry future contract.

A fixed expiry contract suits investors who do not need fungibility and want to maintain their exposure over time. However, managing price convergence and rollovers adds cost, as well as risk, recognizing that this specifically may be part of the trading strategies of some investors. On the other hand, Perpetual Swaps play more closely to the needs of those who want to unwind in the near term.

As there is greater adoption by institutional investors in digital assets, financial institutions are keen to understand which route to market is most fitting for their own institutional perspective, be it as a bilaterally traded NDFs\(^3\) or providing access to their clients through exchange traded and centrally cleared futures, with a capital light framework being a key decision driver.

\(^1\) The Funding Rate Mechanism refers to the relationship between the swap price, underlying price and funding rate which is generally between -0.025% and 0.025%.

\(^2\) A Perpetual Swap is a pre-funded swap agreement without an expiry date, marked to market using the agreed funding rate. It is “light touch”, removing the need to rebalance or roll and provides a low risk versus return way to obtain exposure.

\(^3\) An NDF is a non-deliverable forward contract in which counterparties settle the difference between the contract forward price and the spot price on the agreed notional amount.
2. TRADING VENUE

The availability of continuous liquidity [market making] is a central tenet of any organized trading venue. The current CLOB model is premised on market makers, having evolved from the open outcry trading floors model we associate with colorful jackets and waving arms to "make a market" to traders now sitting in front of multiple trading screens to guarantee minimum bid/ask spreads throughout trading hours. Is this CLOB model outdated, given that smart contracts can replicate liquidity and market making models through an AMM [Automated Market Maker] model? Liquidity, spreads and fee levels can equally be delivered robustly through smart contract protocols with buyers and sellers facing the central liquidity pool rather than the need to match bids and offers and liquidity pool rebalancing handled by automated protocols. An AMM applies funding rates plus external reference prices to balance supply and demand. As with any market, in the event that AMM prices deviate from the broader market, the playing field will be levelled via arbitrageurs' participation.

3. POST-TRADE PROCESSING

Despite significant process automation, the global exchange and clearing house infrastructure is multi-layered and fragmented and is largely sequential between the exchange, clearing house, exchange members and end investors. Trade allocation, matching, booking and reporting is a sequence of multiple data records across fragmented and siloed infrastructures, reconciled between parties through the integration of different data sources [structures and formats]. Moreover, the availability of "real time" information is limited to a distinct number of processes. The net result is a business model, technology stack, and headcount intensive setup that continues to plague the industry.

New market infrastructure providers for digital assets are seizing the opportunity to create an integrated single [virtual] tech stack-based model, not limited to pre-trade, trade and post-trade processing, but also including a common direct access model for all client interactions [including but not limited to participant onboarding processes and in-platform participant control of cash and collateral management]. This provides control and oversight integrity between trading and open exposures, removes inefficiencies and potential points of failure between execution and clearing, and also gives investors direct control of funding on a 24/7 basis in line with trading uptime. DLT based business models and associated technologies can provide a foundation for a "single version of the truth" that could, over time, be rolled out across the entire capital markets value chain and, in the process, revolutionize the client interaction model and the role of traditional sell-side institutions. These new marketplaces operate 24/7 X 365 days, and many are aligned to spot trading. Furthermore, with fewer batch processes, positions can be netted more frequently, and margin calls and portfolio/credit risk checks performed far more regularly [i.e., intraday > hourly] than what, historically, has been daily, on an end of day basis, between CCP, FCM and sell/buy-side firms.

4. RISK MANAGEMENT

A single front-to-back model removing manual processes and processing delays, coupled with smart contract technology, opens up new possibilities to manage risk exposures. For example, new incumbents have shown that it is possible to evaluate counterparty and market risk in [quasi] real time, which provides the ability to restrict trading automatically and auto-liquidate existing exposures that are under-collateralized.

In TRADFI, different regulatory methodologies and approaches to regulatory compliance between the US and EMEA – i.e., on the methodology that determines the minimum margin levels clearing houses must apply, have created an uneven playing field between both regions. In the CC space, the tradition lives on, with the US-based CFTC classifying CCs as a "commodity" that has enabled US firms with a first mover advantage for derivatives. However, the industry feedback is clear: whilst other jurisdictions, including Switzerland, the EU/UK and Singapore, continue to evolve Crypto regulation on a standalone basis, there continues to be a glaring absence of a more coordinated approach towards CCs at an
Impermanent Losses are defined as an imbalance in the liquidity pool that crystallizes when liquidity is withdrawn from the pool. It stems from the difference between the dual asset prices at the time the liquidity was invested versus the market price at withdrawal.

International level — the lack of regulatory clarity continues to hamper the progress of Crypto markets and the possibilities of novel business models provided through the use of DLT based solutions.

From a credit/ counterparty perspective, a key question revolves around the optimal settlement cycle, i.e., the optimal settlement period [the current period is T+2], taking into account end to end interdependencies across credit risk, capital, funding and process needs. However, in an automated smart contract protocol-driven world, the dynamics and interdependencies between capital, credit and operational risk change and thus provide new impetus to re-examine how industry wide settlement inefficiencies — among other inefficiencies — can be further reduced. Considered in a model where unfunded positions are liquidated automatically, i.e., on an hourly basis — do these first- and second-line defenses on reflection, get compressed to a single hour of market and counterparty risk, and if so, what is then a suitable settlement period to deliver stability and investor protection for that new timeline?

Moreover, it is noteworthy that an AMM model could bring into play new risk factors — i.e., around the quality and role assumed by liquidity providers. Liquidity providers have a percentage share of tokens in the liquidity pool based on contributions of equal ratios of an instrument air [e.g., BTC/ETH]. Percentage based liquidity withdrawals result in an imbalance in the remaining token pairs in the pool. It is essential to consider that such an “impermanent loss”*, e.g., the imbalance between tokens, is borne by the remaining liquidity providers in the pool.

5. REVENUE MODEL

The traditional exchange and clearing house fee structure model combines trading fees, clearing fees and contract expiry fees. In addition, and less transparent to investors are costs such as haircuts on non-cash collateral and spreads taken on cash deposited to meet margin requirements. For investors, the regulated exchange model is an indirect access model whereby platform members levy additional fees to their end clients to cover their overheads [i.e., market access, infrastructure, clearing and reporting, risk related charges including credit risk and default funds contributions]. With increased overall member costs, resulting from negative interest rates and capital charges, and increased regulatory oversight continuing to erode profit margins, members are compelled to claw back the effects of fee compression from end investors.

Conversely, the direct access model of most Crypto venues strips out several layers of cost. For example, by having a fully electronic client onboarding process and a single/ integrated technology stack [that removes downstream integration costs, minimizing maintenance expenditures and eliminating overhead costs arising from processing data across functional silos] runs on a substantially lower cost base than the traditional model. Crypto venues, do however, charge various new direct costs, including the conversion from Fiat to Stable Coins and fees to withdraw cash.

It is also worth considering the possibilities of alternative opportunities and new business models [i.e., leveraging AMM based models] that have the potential to create incremental revenue streams, such as:

A. Variable Fee Structures: the exchange and CCP model tends to apply different fees for proprietary, client and market maker flow and, at times, volume-based rebate schemes, which are cumbersome to track. AMMs pave the way for far more flexibility. Smart contract based protocols can incorporate fee level and commission sharing percentages, not just on volume or trading member category but on a trade-by-trade basis.

B. Incentive Based Models: with an AMM model, trading fees are earned directly by the LPs (Liquidity Providers) aligned to the amount of liquidity provided, delivering a more balanced risk/ return approach.

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* Impermanent Losses are defined as an imbalance in the liquidity pool that crystallizes when liquidity is withdrawn from the pool. It stems from the difference between the dual asset prices at the time the liquidity was invested versus the market price at withdrawal.
C. Centralized Member Liquidity Pools versus Individual/ Permissioned Liquidity Pools: in addition to providing liquidity to the central liquidity pool, there could also be an opportunity for banks to create a bank specific liquidity pool [assuming proper KYC and AML/ transaction monitoring is in place] available only to their respective client base and to construct their own fee model protocols associated with such pools.

In light of the above, a key determining factor is the convergence point between the traditional exchange model and the new venues, in particular as the market starts to experience an inflow of liquidity from institutional investors.

For institutional adoption, [considering spot isn’t possible for regulatory reasons] the key questions revolve around regulatory clarity, the availability of capital efficiency [integrated] trading and settlement models, and of an availability of efficient infrastructure and operating model.

Institutional adoption and associated platform requirements need to account for the advances that new crypto venues have made. Among others is the adoption of single stack technology, delivering direct, continuous market access, and a new approach to pre-and-post-trade risk management. Furthermore, the need for capital efficient [integrated trading and settlement] models is paramount to the broader adoption of CCs.
CRYPTO EXPOSURE MARKET NEEDS

Crypto can be traded 24 X 7 X 365 days a year, yet no single reference price exists for any of the individual COINS; individual exchanges have varying market shares in any given coin, and none of the major players has a "dominant" position – both in terms of market share and share of influence. Accordingly, price discovery and best execution remain challenging.

Irrespective of where the convergence between the traditional exchange and clearing house and emerging CC trading venues lands, some core components are imperative for the provision of exposure solutions; in particular:

1. **Product Structure:** to determine the product/instrument configuration i.e., NDF/Perpetual Swap, or fixed expiry future. The structural aspects of the product, combined with the pricing and cash flow components together with the legal wrapper will significantly impact the trading and clearing model.

2. **FX:** determining the question of contract currency, be it USD in line with spot market and listed derivatives contracts already listed in the marketplace or perhaps listing and, or just settling in an alternative currency that may align to some IIs.

3. **Basis Trade Capabilities/ Integrated Spot/ Derivatives Market:** undoubtedly, a single integrated model is required for spot and derivatives. At a minimum, this means the ability to trade derivatives 24/7, 365 days a year across different assets and instruments in an integrated fashion, including the continuous risking and ability to collateralize exposures on the same continuous basis; not least to simplify trading strategies and to also to rationalize the often-hidden total cost of ownership, e.g., onboarding, integration, technology and operational support.

4. **Platform Stack:** to exploit efficiency gains, there is a need for a single integrated end-to-end infrastructure to enable cross asset class and continuous portfolio margining, integrated risk, capital and collateral management.

5. **Capital Efficiency:** one of the key requirements for the future is the provision of Capital Efficiency [CE] across trading and settlement. Achieving CE requires clarity around product, structure and trading arrangements from the onset, whilst retaining flexibly around future needs to accommodate asset class convergence and novel smart contract based business models.

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**CONSIDERATIONS**

1. **Copying the Past vs Build the Future?**
   - Degree of Regulations: D1 vs DN
   - Prioritization i.e., Time to Market/ T2R > Roadmap
   - Commercial Model and Business Case
   - Governance
   - TOM ... 24 X 7 X 365

**PRODUCT/ INSTRUMENT**

- NDF
- Fixed Expiry Future
- Perpetual Swap
-...

**CURRENCY**

- USD
- EUR
-...

**CAPITAL EFFICIENCY**

- Bilateral
- Centrally Cleared
- Regulated/ Not Yet Regulated

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**BUSINESS MODEL INNOVATION IMPLICATIONS: A DEMOCRATIZATION OF ALPHA?**

Many Systemically Important Financial Institutions [SIFI] are in the vanguard to explore how they can deliver CCs [BTC/ ETH in most cases] exposure to their institutional clients and where that convergence point will be between traditional business models and that of the new Crypto venues. Therefore, a major factor in future proofing the business will be the degree of integration between trading and settlement and the underpinning technology stack that will have to support client needs and the evolution of product solutions as regulatory changes unfold.

Moreover, with market changes and the subsequent ability to launch new business models, there is also an opportunity to reconfigure the profit pools across the Capital Markets Value Chain [CMVC] that could have lasting implications on the balance of power between buy and sell-side institutions. For example, proprietary business models and algorithmic trading models may soon be democratized via the rise of DEFI native instruments being created [here DE stands for democratized and no longer decentralized or distributed]. These emerging DEFI protocols, often open source based, package up derivatives strategies in an easily accessible manner to the broader investor community and thus have the potential to remove ancillary investment costs associated with more complex trading practices and strategies.

Protocols such as “Strike Tokens⁵”, similar to traditional option contracts, cater to different risk / return appetite levels/in an accessible way, via a predefined protocol wrappers. Moreover they deliver added capital efficiencies versus a “perpetual swap” or “leveraged token” by removing funding rates⁶ and the need for rebalancing. Similarly, “everlasting option⁷” protocols

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⁵ Strike Tokens are DEFI protocols that enable the user to get exposure to buy or sell an asset based on the user’s determination of where the asset will increase to decrease in value to for the period, they want to hold the token.
⁶ The Funding Rate relates to the overall costs that would be incurred by the user to get exposure by holding the contract directly or by accessing exposure in alternative ways such as through Futures contracts.
⁷ Everlasting Options exhibit the following criteria as a Perpetual Swap in that, different to traditional American or European style options the contract does not have a predefined expiry date.
arguably contribute to fairer market pricing by reducing liquidity fragmentation resulting from market makers having to spread capital risk across multiple fixed expiry dated instruments.

At the innovative end of the product spectrum, and gathering significant momentum over the past year, are DEFI Options Vaults [DOVs]. DOVs allow investors to "park or stake" their assets into Vaults [much like providing liquidity to an AMM]. The assets are then deployed into DEFI protocol strategies to essentially sell "covered put strategies", from which they can earn up to three sources of income; namely: 1. yield from the protocol trading strategy itself, 2. token rewards and 3. staking yield from the collateral held in the vault. On the other side of the trade, market makers earn returns from competing to buy the options in the vaults. The point of real interest is that DOVs shift the landscape of DEFI from one where token yield is the main source of yield to one that brings organic yield through monetizing volatility in the underlying asset, paving the way for scalable trading of non-linear instruments on DEFI.

The possibilities of DEFI protocols to advance capital markets and the investment landscape are infinite and, of course, not unique to the derivatives market. Yet, DEFI may not be the "holy grail" to push the investment agenda. In reality, DEFI is still very much an arena of musical chairs, lacking liquidity loyalty, partly due to diminishing token incentives of vanilla DEFI protocols getting muddied with true investment yields, and thus begging the question of sustainability of such DEFI returns and token incentives as models such as DOVs evolve and continue to rearrange the deckchairs.

Whilst the ultimate potential of DEFI is to be demonstrated, a Shaper of the Future has to be on the front foot of these new and exciting paradigm shifts in the investment space and combine intellectual curiosity with a meaningful level of engagement to determine the implications and opportunities that CCs and DEFI provide. For a SIFI, this implies figuring out a meaningful way to participate in an emerging and potentially strategically important new development whilst keeping grounded in reality and mindful of current regulatory compliance and regulatory constraints which are a moving target. AMM and DEFI adoption is not simply research and pilots but, similar to algo trading in previous decades, is already being adopted by the few. Conceivably, it will not be long before such DEFI protocol may well democratize Hedge Funds.

CONCLUSIONS

Given the extent of available options between the traditional model and the wide range of emerging technologies – be it AMMs, smart contract driven liquidity pools or DEFI protocol strategies – what is the best starting point for a new model to also ensure that it is future-proof?

The design of any modern derivatives platform ought to keep future-proofing in mind and adhere to the emerging needs of major market participants. Accordingly, a sensible starting point for potential providers of derivative [infrastructure] solutions to consider when embarking on the design of a next generation platform and associated products boils down the ability to deliver: 1. liquidity; 2. capital efficiency [via integrated trading, clearing and settlement]; and 3. a future proof approach to Digital Assets in its totality to support the eventual convergence of DFA and CCs.

Any foray into CC and DEFI should provide optionality for participation and the ability to generate incremental revenues from new products, solutions and services. This optionality can be defined along two dimensions: 1. Betting on the "winning color", i.e., optionality with regards to the platform design and associated business model; and 2. Flexibility with regards to functions and features of that business model/ platform allows FIs to cater to evolving customer needs. Having choices implies tradeoffs and difficult decisions – ideally, one wants to keep optionality for as long as possible and bet on a portfolio to minimize the risks [of making the wrong decision before the winning formula starts to crystalize] similar to a VC investment strategy. The use of Real Options [for component part developments i.e., AMM based protocols] can be an effective strategy to get access to a set of high potential plays in a capital efficient way.
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Peter T. Golder joined SIX Digital Exchange [SDX] in June 2020 and serves as its Chief Commercial Officer with a mandate to define and execute innovative and commercially viable business models to establish SDX as a leader in global institutional Digital Assets and Crypto markets.

Peter is a Board member of the Global Blockchain Business Council [GBBC] and the Ethereum Enterprise Alliance [EEA]. In addition, he serves on the InterWork Alliance [IWA] Leadership Council and is an advisor to the FinTech Council of the International Capital Markets Association [ICMA]. Peter regularly publishes on industry matters and is a frequent speaker at [Digital Asset and Crypto] industry events.

Peter is a passionate financial services entrepreneur, executive and investor with over 25 years of international capital markets and investment banking experience. Peter is an advocate of the power of data and technology to enable the creation of innovative/disruptive business models to build a more trusted, sustainable and effective financial services ecosystem.

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About SIX and SIX Digital Exchange

SIX is a major Financial Market Infrastructure (FMI) provider that operates exchanges and Centralized Securities Depositories (CSD) in Switzerland and, via the acquisition of the BME in 2020, also in Spain. SIX runs the payments system in Switzerland and operates payment infrastructure on behalf of the Swiss National Bank. SIX also manages a financial information business focused on providing data products and services to financial institutions globally.

SIX is building new digital market infrastructure in its fully owned subsidiary SIX Digital Exchange (SDX). SDX has obtained FINMA licenses for its Exchange and Central Securities Depository (CSD) and plans to offer issuance, listing, trading, settlement, servicing, and custody of digital assets. SDX is also a global leader in the development of Central Bank Digital Currency (CBDC) via its partnership with the Swiss National Bank and the Bank for International Settlements. SDX has partnered with SBI Digital Asset Holdings from Japan to set up a similar digital market infrastructure offering in Singapore.

SDX Vision

- a trusted global integrated institutional liquidity network and ecosystem
- for the issuance, trading & settlement, transfer, custody of digital assets
- in both public and private markets as well as regulated digital securities and crypto assets
- underpinned by a data collection and distribution layer advanced analytics capabilities
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