

Dr Peter T. Golder — November 2021

The future is already here — it’s just not very evenly distributed.

William Gibson

1. DIGITAL ASSETS — CLEARED 4 TAKE OFF

The current Financial Market Infrastructure [FMI] industry is defined by a handful of companies that control powerful and trusted centralized platforms. However, market structure is changing – its main characters and structure will likely look quite different a decade from now.

In the case of financial exchanges, the imperative for potentially wide-reaching changes stems largely from three macro drivers, namely: 1. the emergence of Digital Financial Assets [DFAs] and Cryptocurrencies [CCs]; 2. changes in market structure stemming from the disruptive potential of Distributed Ledger Technology [DLT] and 3. in particular Decentralized Finance [DEFI].

The idea of transferring ownership via DLT using smart contracts is powerful. Today, transactions and change of ownership are conducted via trusted centralized exchanges and intermediaries; often associated with significant commissions and fees to ensure these transactions are executed and processed in an orderly manner. If the same thing can be done using DLT – without giving up control of one’s assets – what long term value does conventional legacy FMI really bring?

THE SIZE OF THE PRIZE: between 2025–2027, approximately USD 24TN of financial assets are expected to be tokenized as DFAs with roughly 10% of global GDP being stored or transacted on blockchain/ DLT up from about 1.3% in 2021.

However, the evolution and growth of DFA through tokenization requires an effective solution to the “Cold Start Problem”; namely the emerging DFA markets lacks: assets, liquidity and dedicated Digital Market Infrastructure.

CCs hardly need any introduction and institutional demand for this alternative asset class is constantly increasing. For example, Bitcoin exhibits a massive 313% CAGR since 2018 with the number of worldwide blockchain wallet users increasing from 6m in 2016 to over 64m in 2021. The global inflow of money into DFA and CC and related M&A activities show a similar picture: institutional demand is fueling the build out of global Digital Market Infrastructure [DMI].

Furthermore, there are several additional drivers that affect and mandate change that will shape the global capital markets landscape and the fabric of the financial market infrastructure. The usual suspects i.e., regulation, competition, technology advances, and changing client requirements come to mind and for the purpose of this discussion they should be considered as Business as Usual [BAU]. It is therefore worth focusing on the idiosyncratic DFA and CC trends and drivers that are likely to shape the development the future requirements for financial exchanges.

1 Special thanks to Pete Stephens, Michele Curtoni and Lee Pickavance for feedback and comments on earlier versions.
3 Source: WEF, Statista, Bain, BIS and YouGov.
However, we need to acknowledge that we cannot predict the future, because it is impossible to consider all the small factors that may have a disproportionate impact in the long-run – this is a nonlinear process. Accordingly, as SHAPERS – not predictors – of the future, it is paramount to have a framework that that can be used as a reference point to allow us to understand relative importance of what tends to impact evolution of global capital markets and in particular the world of Digital Financial Market Infrastructure.

2. TRENDS IMPACTING FINANCIAL EXCHANGES

Whilst there are a few factors that affect the “evolution” of financial exchanges, seven key trends in the DFA and CCs space will likely affect the shape of things to come in the “traditional” exchange space.

1. DFA – SECURITIES, CRYPTO, STABLECOINS/ CBDC, … NFTs

The creation of DFA is on the rise albeit from a low base and is subject to the Cold Start Problem [CSP] being resolved in line with institutional requirements. The issuance of DFA can be achieved through a two-step process [subject to the starting point] and involves securitization [if there is no regulatory complaint security] and subsequent tokenization of that security. Solving for institutional DFA requirements, the “manufacturing” process needs to provide a scalable, standardized and cost-effective means towards issuing these digital assets to guarantee asset transparency and interoperability.

THE STARTING POINT – more illiquid and less transparent with less/ no established or dedicated market infrastructure. Conversely, at the more liquid end of the market [listed securities] there is plenty of established infrastructure and FIs are well connect across these market segment which typically benefit from high degrees of automation.

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4 The Cold Start Problem refers to the limited availability of DFAs which has been hampered by fragmented markets and accordingly a lack of institutional infrastructure, liquidity and resulting in a limited pool of Digital Financial Assets.

5 Interoperability Considerations for Digital Financial Assets, Peter T. Golder, 2021
The fact that DFA operate on DLT renders a lot of existing FMI infrastructure obsolete and requires a dedicated parallel setup to deal with the idiosyncratic needs of DLT based systems and thus increases the hurdle for existing FIs to adopt new DLT solutions unless the overall market is reaching a pivot point and thus provides the necessary incentives to switch. At the illiquid end of the spectrum, the hurdles are a lot lower given the absence of dedicated existing infrastructure. Furthermore, the adoption rate and ultimate success of DFAs is related to market segments and the overall monetary system.

- **PUBLIC OR LISTED MARKETS** encompass the traditional and well-established bastions of capital markets include publicly listed securities of Equities and FICC [Fixed Income, Currencies and Commodities] issued in the form of regulated securities. Across these segments, FMI is well established and accordingly, the degree of automation and Straight Through Processing [STP] is high. Thus, the introduction of a new “technology” paradigm [i.e., DLT] aimed at substituting and eventually replacing current FMI faces strong headwinds given that Financial Institutions have existing legacy infrastructure, and any change needs to be ecosystem wide to maintain network effects.

- **PRIVATE MARKETS** include equity and debt of privately owned companies and alternative assets and a growing list of alternative assets. When compared with public markets, private markets tend to exhibit lower degrees of transparency and lack the infrastructure that exist across listed markets and thus exhibit lower barriers to entry for novel “emerging technology” and underlying infrastructure.

- **CCs** [e.g., Bitcoin and Ethereum] do not follow the public versus private market dichotomy where the infrastructure is largely supported by centralized systems. For CC, existing capital markets “systems and platforms” are supplemented by infrastructure based on public DLT networks. Whilst Bitcoin is mainly used for payment and investment purposes, Ethereum can further fulfill the role of a “reserve currency” through the use of smart contracts that are at the center of its transactional ecosystem.

- **STABLECOINS [SC]** are DFAs backed 1:1 by FIAT reserves or linked to other financial assets or claims. SCs facilitate transactions between different CCs and bridge the gap between digital and traditional fiat money plus they also serve as collateral in the growing world of DEFI. However, many SCs are not fully backed by cash but instead use a mix of short-term debt [i.e., commercial paper] and other less liquid assets which means any rush of redemptions could trickle into adjacent markets. With total SC market capitalization is in excess of USD100bn, regulators and rating agencies call for increased regulation to improve transparency and force a gradual migration of SC collateralization reserves to less risky assets [Basel Committee on Banking Supervision proposal: SCs could slot into existing regulations with banks needing to ensure that SCs are backed effectively at all times].

- **CBDC** uses an electronic record in the form of a digital token to represent the digital form of a fiat currency of a particular sovereign nation; CBDC is centrally issued and regulated by the competent monetary authority of that nation. CBDC aims to bring in the best of both worlds – the convenience and security of digital form like cryptocurrencies, and the regulated, reserved-backed money circulation of the traditional banking system. The availability of CBDC – alongside SCs – could play a vital role for the efficient and cost-effective functioning digital capital markets and the evolution of DFAs.

**EXHIBIT – E YUAN [ECNY] SCOPE:** it was reported that Chinese cities are integrating an ECNY payment option within their mass transportation systems ... and the Chinese government testing ECNY’s programmability for specific usage and traceability i.e., limiting how ECNY funds can be spent. The availability of the ECNY will likely increase the pressure on other nations to follow suit and introduce their own CBDC, in particular if they the ECNY gains traction i.e., via the “Belt and Road Initiative”.

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2. SOLUTIONS SPACE — FUNCTIONS 2 MARKETPLACES
The success of DFAs is further linked to the success and number of marketplaces, applications and functional improvements across Capital Markets Value Chain (CMVC) activities that can make effective use of these new digital capabilities; in particular:

- Functions and activities such as asset servicing, reconciliations [atomic settlement has the potential ultimately eliminate reconciliations] and the role of transfer agents are examples of traditional pain points in the CMVC and can greatly benefit from the introduction of DFA, smart contracts and the underlying DLT infrastructure. However, the potential benefits are linked to the size of the network [as the part of the overall ecosystem], the ability to capture a material part of the end-to-end process [and associated] data via the use of standards — ultimately leading to a world where post trade is a lot less relevant [on the assumption that we can get the 1st steps fixed].

- Solutions and marketplace opportunities able to leverage blockchain idiosyncratic features could include repo [repurchase agreement] trading and securities lending; markets where there is significant potential to inject transparency, efficiency and thus create more effective business models.

3. FROM OFF 2 ON PLATFORM TRADING
Innovation is giving exchanges an opportunity to extend their technology and infrastructure into new and adjacent markets. In parallel, an increasing amount of transactions are carried out online. In addition, CC, DFA make use of exchange-like mechanisms while NFTs [Non Fungible Tokens] provide a mechanism to exchange authenticated digital art electronically. DFAs unlock the potential to make “things” tradeable in a format that has previously not been available.

An effective and concerted foray into DFA, in particular in private markets, can significantly benefit from a trusted “Operator” led initiative aimed at addressing the Cold Start Problem [CSP] through a coordinated effort to kick start the adoption of DFA. Furthermore, a common development across both public and private markets is the migration of transactions from OFF2ON platform in part to organize the exchange of value and transactions in an economically optimal manner and thus further benefits from having a governance structure that promotes adoption of DFA.

4. GOVERNANCE — THE OPTIMAL ORGANIZATION OF TRANSACTIONS
In 1937 Ronald Coase in his seminal work “The Nature of the Firm” introduced the concept of transaction costs to explain the nature, limits and boundary conditions for the existing of organizations and under what conditions they are the preferred mode for transacting. The theory made a major contribution to economic theory and Coase’s transaction costs approach has been influential in modern organizational economics. Furthermore, the design of new business models and ecosystem needs to account for adoption and collaboration is a function of incentives and rewards.

Hence, the existence of “exchanges” as a cost-effective means to transact or transfer financial value amongst firms can in part be explained through the work done by Coase. Accordingly, changes to existing governance and transaction cost structures can be expected to affect the structure and organization of how economic actors organize the exchange of value.

5. DECENTRALIZATION — BUILDING BLOCK MODULARIZATION
Bitcoin, Ethereum and the emergence of DEFI through blockchain are the harbinger of breakout trends, like a broader decentralization of the web – in the form of WEB 3.0 and the Internet of Value [IoV] – and away from centralized applications and the broader client-server architecture which confers tremendous power onto whoever runs the server. A server administrator has unilateral power to set the rules, grant and revoke access, and control the data,
often without users having a say or being aware. Information is asymmetric and causes an imbalance of power. This is one of the reasons that today just a handful of companies are running much of the world’s software.

However, we may have reached peak centralization and the pendulum is starting to swing the other way – think of decentralized social media where an individual “wallet” is at the center that has embedded KYC/AML and can query any social media protocol via a “socialGRAPH”. Furthermore, the sudden rise of cryptocurrencies and associated protocols has created an environment that is conducive to a shift in the balance of power away from states, central actors and monopolies and towards the sovereignty of companies and individuals.

Modularization, one of the key concepts of DEFI, is based around the use of open-source software and hence transparency around the key building blocks of DEFI. In particular, the ability to combine various DEFI protocols – the equivalent of microservices for capital markets – and thus build institutional grade financial solutions without the need to develop fully integrated vertical stacks which is the prevailing model for most FMIs and market participants today. The use of these financial modules and protocols is based on three common features, in particular:

• Composability: a DEFI software application can be forked, remixed, and reused in many other applications. In particular, Crypto Primitives – protocol based incentives systems that are uniquely enabled by tokens – form the generic building blocks that are designed to do one very specific task in a highly reliable fashion; they include: financial, regulatory [securities protocols] and governance [staking, voting] primitives.

• Transparency: DEFI software is open source; it is completely auditable to know exactly what the smart contract is doing in terms of functions, user permissions, and user data.

• Auditability: the underlying blockchain/protocols are based on open-source software, the entire flow of funds is completely auditable including collateral, trading volume, defaults, etc.

Blockchains such as Ethereum, Solana and Polkadot and their modular component parts [i.e., smart contracts] are platforms that enable the deployment of modular financial solutions in a cost effective and efficient manner.

DEFI ACRONYMS – CEX DEX AND AMMS: One of the key features of DEFI are smart contracts which can be used for building a completely decentralized exchange [DEX]. A key question when comparing a CEX/DEX model is how does a decentralized exchange create liquidity?

In the traditional centralized model, exchanges provide traders the ability to transact without drastically affecting that asset’s price through central order book of buyers, sellers and incentivizing market makers, normally sophisticated institutions, to stand in the middle match between the two. In a DEFI environment, liquidity incentives are provided through AMMs [Automated Market Makers]. Where smart contracts can collect liquidity from many providers into a larger pool that traders interact with rather than through an order book with centralized market makers. In an AMM, price formation happens with a mathematical formula – as liquidity is exhausted in a particular pool, it becomes more expensive to transact with that pool – rather than via central order book. AMMs are democratizing liquidity provision; anyone can post liquidity to a decentralized exchange with the potential to profit in the process.

Whilst today AMMs focus predominantly on CC, the expectations is that use cases outside CC will materialize over time. Today, an impediment that affects the CC space stems from the “Oracle Problem”, which means DLTs cannot easily interact with a non-DLT system. For example, an Ethereum based AMM struggles to incorporate daily prices of non CC assets into its process. Therefore, for now the Oracle Problem keeps innovations like AMMs from impacting traditional finance in a major way; though it is likely only a question of time before technology improvements allow this issue to be resolved.
EXHIBIT WHAT IF the S&P 500 Index was linked to a token on a public permissionless chain [i.e., Ethereum]? Financial Institutions could post liquidity to an S&P 500 AMM liquidity pool and trade this token on that AMM. Arbitrageurs would ensure this token traded in line with the S&P 500 tick for tick. Owners of this token would have no direct or indirect ownership of any company equity, but could profit off the index’s movement nonetheless, just like traders of the CME futures contract. Therefore, a token derivative market could provide AMMs and DEXs with an opportunity to enter a much wider world of potential use cases.

6. REGULATION: “KEEPING UP WITH THE JONESES”
The substantial and rapid increase of value locked up in DEFI protocols [Total Value Locked] has been noticed by a broader set of financial actors outside of the frontier investors and crypto/DEFI pioneers. In particular, regulators are grappling to understand potential ramifications of automated trading venues [i.e., AMMs via DAOs, liquidity pools, etc.] and new forms of crypto assets [DEFI governance and liquidity tokens]. Regulators and elected officials need to raise concerns about new technologies and their impact on society – that is part of their job.

A key issue is the approach to regulating blockchains, smart contracts, decentralized applications and organizations in a globally coordinated fashion [to avoid regulatory arbitrage right from the get go] whilst recognizing the limitations of local regulatory frameworks in that they cannot be exported – i.e., global actors can use local regulation though they are then subsequently bound by that local regulation which may lead to regulatory fragmentation i.e., the inability to net asset using a single framework.

Furthermore, the dominant logic of the 20th century that these “things” are run by centralized companies and can thus be regulated with traditional means may not lead to an optimal outcome i.e., the law of unintended consequences when dealing with extra territorial effects of law. These “things” are software and can run without any company operating them [i.e., a DAO or Decentralized Autonomous Organization]. Therefore, what does it mean to “regulate and/or worst-case scenario shut down” one these decentralized software applications? It may take the time to understand how this stuff works and think about new ways for society to achieve a balance between mitigating risks whilst maintaining the benefits. As Fred Wilson points out: “… that’s a harder path but a better path”.

EXHIBIT – SINGAPORE PERSPECTIVE: in “Decentralized Finance and the Future of Money”, MAS shared its perspectives on the future of FMI; in particular two are points stand out:

1. Technology [i.e., in the form of DLT] is enabling a fundamentally different approach to financial infrastructure, compared to the centralized systems of today.

   • Take open crypto networks based on self-executing smart contracts and non-custodial financial services, where users maintain control over their assets at all times.

   • By replacing intermediaries and central parties, these networks aim to reduce both the cost and risk of finance.

2. By decentralizing key aspects of financial infrastructure, such as access, data, and code, open crypto networks can also potentially enhance inclusion and innovation.

   • When firms of all sizes, and even individuals, can directly access financial infrastructure, it could mean more competition and inclusion.

   • When transaction data is available to all participants, and not confined within the intermediary responsible for the transaction as is the case today, it could mean more contestability and transparency.

   • When code can run directly and publicly on these networks, unlike proprietary code that runs on private servers, it could mean more interoperability and innovation.

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1. i.e., FT, 20210626, Regulators Begin to Grapple with DEFI
7. EXPONENTIAL ERA — AMARA’S LAW
It was Greek philosopher Heraclitus who said that “change is the only constant in life.” However, the speed of change or progress is exponential rather than linear; in particular when “technology” is one of the underlying drivers.

However, according to Albert Allen Bartlett “… the greatest shortcoming of the human race is our inability to understand the exponential function.” Hence, “most people overestimate what they can achieve in a year and underestimate what they can achieve in ten years.” Bartlett further states that “… every discovery was a nervous shock to some orthodoxy … we would know no more … if it were not for the rebellious, the recalcitrant, and the intransigent.”

In his essay “The Law of Accelerating Returns”, Ray Kurzweil shows how we misunderstand the meaning of exponential growth in technology. Correctly spotting a new cycle as it unfolds can be immensely profitable; misreading it can be devastating. First movers in a new area often struggle to survive the trough, even if they are the ones who do the essential research and development.

If we are trying to assess the future impact of a new “technology”, we need to separate its true value from its public perception. When something is new, the mainstream hype is likely to be more noise than signal. Hype serves a real purpose in the early days: it draws interest, secures funding, attracts people with the right talents to move things forward and generates new ideas.

THE ADJACENT POSSIBLE: Why does “technology” grow at an exponential rate and why don’t we see it coming? One explanation is what Stuart Kauffman describes as “The Adjacent Possible.” Each innovation adds to the number of achievable possible future innovations and thus opens up adjacent possibilities which did not exist before. As limits and constraints melt away, options explode. The exponential growth of “technology” is known as accelerating change and it is believed that the rate of change is increasing and society will change dramatically alongside it.

Therefore, the ability to 1. adapt dynamically to a constantly changing environment and 2. react to evolving requirements [client driven, regulation imposed, …] providers market participants an opportunity to shape the future and thus evolve the global capital markets ecosystem.

3. BUILDING BLOCKS 4 SHAPING THE FUTURE
Solving the Cold Start Problem successfully results in establishing a winning ecosystem that can attract and retain sufficient liquidity and establish a de facto industry standard by igniting the DA ecosystem to relies on a number of factors:

8. MINDSET: one of the biggest challenges in shaping the future is the need to unlearn the past and imagine what the future could look like and thus moving away from a deterministic mindset and dominate logic of the 20th century that dominates in most FMIs – shaping the future requires a switch to a probabilistic mindset.

One way to deliberate about potential outcomes is move away from thinking about change – as a steppingstone towards the future – as a set of very few large long-term bets that most each must be won to succeed. Instead, betting on smaller, near term focused commercial outcomes offers an alternative lean model that is based on the MVP [Minimum Viable Product] idea and allows pivots to coincide with change in the market and thus avoids the “build it and they will come” approach inherent in most large multiyear projects.

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8 The term “technology” is used as a proxy for technological change and evolution of systems and networks that make use of technology to further advance the functional capabilities of the systems and networks.
9 Gates Law: How Progress Compounds and Why It Matters
10 It’s unclear exactly who first made that statement; the most probable source is Roy Amara, a Stanford computer scientist who in the 1960s told colleagues that he believed that “we overestimate the impact of technology in the short-term and underestimate the effect in the long run.” Source: Gates Law: How Progress Compounds and Why It Matters
In short, “the probability of success” in an uncertain environment benefits from a probabilistic approach towards generating sustainable and viable commercial outcomes. This MVP approach needs to be deeply embedded in the fabric of organization and form an integral part of the overall culture.

9. POINT OF REFERENCE: system dynamics holistic approach – one’s starting point is anchored in what one understands from past experience. Inevitably this limits the ability to think comprehensively about new situations that require a novel approach to problem solving. System Dynamics and Second Level Thinking frameworks promote the move towards a holistic framework that can adequately reflect the dynamics inherent in most ecosystems.

10. TALENT/CAPABILITIES: new ways of doing things require new/ different skills and capabilities which in turn drives the need for talent. Having the right people on the right seats doing the right things rights is not specific to decipher the future opportunities for DAF and DMI but rather a genuine requirement that affects the outcome of success over failure. In addition, talent ought to have sufficient “skin in the game” to ensure incentives are aligned with desired outcomes.

11. ORGANIZATIONAL SETUP, GOVERNANCE AND MARKET STRUCTURE: these two dimensions are likely to influence the operating model and competitive position as the industry evolves:

• Setup: traditional FMIs are usually organized as either functionally focused horizontal firms covering parts of the CMVC [capital markets value chain] or vertically integrated functional stacks that attempt to cover the entire CMVC. The level of integration affects both the speed of innovation and the ability to package products and services into commercial solutions. Furthermore, the packaging of bundles provides opportunities to subsidize and incentives wider adoption solutions which in a less vertically integrated environment does not exist and may thus create interesting competitive market dynamics.

• Competitive market structure and the threat of external market entry: in a monopolistic and or oligopolistic environment with high barriers to entry [for example due to regulation], there is less pressure to change the status quo. Conversely, in contestable or competitive markets the pace of change is likely to be higher due to the threat of new and or external players entering the market which in turns the need to innovate and go to market requirements.

12. SPEED: the global currency for dealing with the requirements of the Exponential Age defined as the ability to be and remain at the forefront of innovation and shape the agenda of DMI and global capital markets in line with expected client and ecosystem demand. A particular aspect of the speed challenge is how to solve/ avoid the Short Term Fixed [STF] issue prevalent in, by nature, risk averse financial market infrastructure firms. STF alludes to the fact that in the short term, change commensurate with external requirements, is difficult to achieve due to the high internal hurdles that must be overcome.

Accordingly, STF limits the corporate ability to invoke change and thus respond to opportunities that have a bearing on the future positioning of the firm. In particular, STF may limits the ability to design an MVP or have a detrimental effect on the ability to pivot in order to maintain “Product Market Fit”.

Finally, luck or the odds of being at the right place at the right time is as always important – although proactively shaping this “building block” may be more elusive than others. A more scientific approach to increase the odds of probability might be through the use of real options that provide optionality for organizations.

We can only see a short distance ahead, but we can see plenty there that needs to be done. Alan Turing
4. POTENTIAL OUTCOMES

What we know with reasonable certainty is that Digital Financial Assets and Crypto are poised to play a major role in the future and thus provide an opportunity for DMIs the broader Internet of Value to perform a major role. With that in mind, a few different scenarios are conceivable in the near to medium term future:

... many of the dots are known, but the intricate way in which they will be connected remains to be seen.

Dr Peter T. Golder

13. DFA — REVOLUTION VS EVOLUTION — AN ASSET CLASS PERSPECTIVE

A key question is whether DFA markets will adopt existing market structures or quantum leap and altogether sidestep what exists today [i.e., comparable to the swift adoption of 5G and mobile broadband in emerging markets]. The bigger the appetite for wholesale change, the less relevant beneficiaries of the current model will likely be — making room for a new class of “disruptive” digital market infrastructure providers that leapfrog existing business models. Hence, there is scope to establish “common ground” across asset classes that lack transparency i.e., the illiquid end of public capital markets or where there is less established market infrastructure i.e., in private capital markets. For example, the aggregation of liquidity combined with the adoption of suitable infrastructure solutions linked with novel business models supported by regulation that provides legal certainties to move transactions onto public DLT networks away from private and often incompatible island solutions.

The implications and consequences of these secular developments will be far reaching due to the expected shift and redistribution of profit pool across the CMVC plus the underlying effects of network economics imply that winners will take most.

EXHIBIT DIGITAL FIXED INCOME — A growing number of FIs have started to issue bonds on DLT recognizing the potential to streamline the process of selling new debt, leading to substantial cost savings in an asset class that has lagged behind in adoption of new technologies. The Motivation: a DLT based End 2 End bond transaction can significantly reduce costs and lower credit and settlement risks.

Over the E2E life cycle of a bond, the use of DLT could yield a 35–65% cost reduction [including pre issuance, primary markets, custody and asset servicing and secondary markets]14. In addition, the use of DLT could cut down the number of intermediaries involved in the process – for example the bonds may no longer need to be registered with a central securities depository. For a “Green Bond”, the costs savings potential, where DLT would streamline the tracking process of the bond’s proceeds, is estimated to be up to 90%15. In addition, DLT offers a way to locate bond holders – often a tricky task in the relatively fragmented world of fixed income where bonds still traded OTC rather than exclusively via CEXs.

Moreover, issuers would find it easier to communicate with investors – some bonds, for example, contain clauses which allow bondholders to sell back to the company if it changes hands. Furthermore, banks could save money on fees charged by trading venues and allow deals to be negotiated without giving away data to the rest of the market. Finally, by lowering the barriers to participation in bond markets, DLT could open debt capital markets to smaller players and ultimately lead to the democratization of global bond markets. However, the journey is likely arduous and the massive investment necessary to change existing debt capital markets’ systems are poised to happen slowly with regulators likely to act cautiously towards a broad adoption of DLT based marketplaces.

EXHIBIT CRYPTO — BITCOIN can be viewed as the starting point for the emergence and CCs and a first foray into emerging digital currency markets. In fact, CCs exhibit some similarities to “emerging markets” – there are great opportunities, but there are various forms of capital constrains; many from the outside

14 Cost Disruption in the Issuance Market: The Case for Tokenization
15 Banks Turn to Blockchains to Reform Costly Bond Market, Financial Times, June 30 2021
world are not yet comfortable to lend to explorers given that the risk profile is not yet well understood, and risk of default remains high. Accordingly, interest rates are higher on CRYPTO island than in the outside world. Moreover, it’s expensive to borrow on the island, and there are few lenders, but borrowed capital can be used to make even better returns. And over time emerging markets have become an integral component of the asset allocation in most investment institutional portfolios.

EXHIBIT BULLISH — Bullish Global, which boosts an initial valuation of around USD9bn is a bet on the growth potential of DEFI. Bullish Global will run a Decentralized Trading Network, which allows users to buy and sell digital assets directly with each other and bypass intermediaries that impose fees, such as an exchange or clearing house. It will encourage trading using automated market makers, which do not trade through an exchange’s central order book. Instead, they deposit their assets into a computer-coded contract, and algorithms search out buyers and handle buying and selling. Owners of assets are incentivized by sharing in the pool of fees generated by trading activity.

However, this is not just about DFAs or CCs. In fact, many innovations in DLT can be extended beyond the world of CCs; namely through novel DEFI based business models and ecosystems reconfigurations that can accommodate a broad range DFAs and support new marketplace opportunities. Bullish Global and similar ventures are aiming to fundamentally disrupt and rewire Global Capital Markets from the ground up with DEFI business models that are likely to redistribute profit pools and the balance of power amongst existing players across a Total Addressable Market [TAM] in excess of USD200 trillion.

14. DEFI — A BUSINESS MODEL PERSPECTIVE

DEFI has grown from about USD15bn to USD65bn over the last six months, according to an estimate by analysts at JPMorgan. Cointelegraph reckons that over the last 12 months, the Total Value Locked in DEFI has grown from around USD1bn to more than USD104bn. In addition, DEFI proved resilient during the March 2020 and May 2021 market crises. It thus appears that “DEFI” managed to conclude the challenge of a global USD100bn POC with flying colors and looks ready for prime time.

SIZE OF THE PRIZE — platform economics of global capital markets favor the few established FMI groups that ensure capital markets run smoothly at reasonable costs for market participants. However, the introduction of DEFI, AMMs and DLT have increased the temptation to shake things; in fact, DEFI has also increased the ability to alter current structures significantly.

One key attraction of DEFI is the opportunity to rapidly deploy alternative business and operating models at scale in a cost-efficient manner [i.e., through E2E automation and the use of smart contracts that embed regulatory requirements such as AML/ KYC and market surveillance]. resulting in not just lower capital expenditure to set up new venues but also lower operating costs assuming like 4 like features and regulatory oversight. AMMs offer full transparency via source code and could thus provide the foundation for overall fairer market structure models.

Furthermore, these algorithmic marketplaces can be much more capital efficiency than traditional counterparts and thus offer broader incentives for FIs to explore alternative market structures i.e., no need 4 explicit market making provided that there are sufficient liquidity providers that have an incentive to make markets; for example via a share of the fee and transaction pool.

The hypothesis thus is that DEFI and AMMs in particular can provide a superior business model and not just reflect a short term regulatory arbitrage opportunity.
5. EPILOGUE

CHANGE AND THE GREAT CONVERGENCE – where does it start and where does it end or does it really matter? Secular change is underway and it will take time for all the pieces to fall into place and it might take time before a “new” equilibrium has been reached. That does not mean sit by the sideline and watch things unfold; rather this is a call to arms FMI participants to start shaping the future and pro-actively engage in writing the next chapter in global capital markets – the starting point can be anywhere.

Nevertheless, like in any “infinite game” there are winners and losers – what distinguishes the leaders from the laggers is the ability to be prepared for the future.

No Crystal Ball – Shapers NOT Predictors of the Future: only time will tell how accurate any predictions will be in the future. In fact, the idea is not to predict the future in the first place but rather to maximize the probability of success through the creation of real options and the flexibility to identify opportunities in time to properly monetize them in an era of constant change that requires an entrepreneurial mindset, the ability to move fast and solve for commercial outcomes.

Maximize the Probability of Success – 5 Building Blocks: 1. aim to establish a diversified portfolio of real options that provide adequate coverage of future eventualities and outcomes; 2. pursue an approach capable of solving the cold start problem and the ability to drive adoption as a function of participant incentives and rewards; 3. put in place a team that has the right background, skills and capabilities to maximize the success of the venture; 4. establish a culture and mindset capable of dealing with VUCA16 including a shift from the dominant logic of the 20th century. That means a shift away from relying on [a few] large directional bets that require high degrees of certainty [in a world of uncertainty] and thus a strong focus on deterministic outcomes [high degrees of certainty] towards an environment that can effectively deal with uncertainty underpinned by probabilistic mindset able to deal with high degrees of uncertainty and a constant change; 5. ensure incentives are aligned with desired outcomes at all levels of the organization and ecosystem.

The stakes are high: clarity of approach and the ability to deal with VUCA in a consistent and coherent manner and an explicit acknowledgment that shaping not predicting the future is the name of the game should go a long way towards maximizing the probability of success for participants building the next iteration of financial market infrastructure aka DMI – whatever the future looks like.

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16VUCA stands for Volatility, Uncertainty, Complexity, and Ambiguity. It describes situations of constant, unpredictable change. Successfully dealing with VUCA requires the avoidance of traditional, outdated approaches to management, leadership and day-today workings.
Dr 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.

Prior to SDX, Peter was the Founder and CEO of Euroclear Information Solutions, where he was responsible for establishing the Groups data and analytics business across a global post trade platform with over €30 trillion of Assets under Administration. Peter also served as a senior executive adviser to venture capital/private equity firms and numerous award-winning FinTech, distributed ledger and Crypto firms.

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
Disclaimer

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