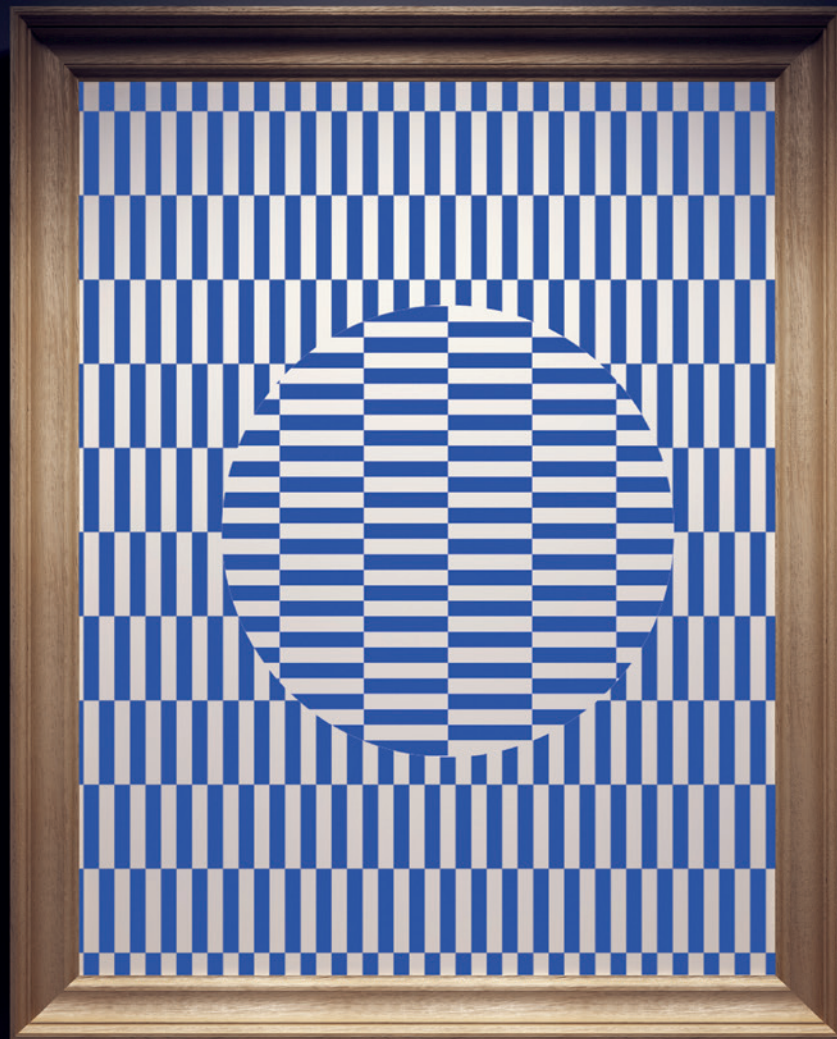


SPECIAL EDITION 2019

TOKEN MAGAZINE



C R Y P T O A S S E T S
A C H A N G I N G P E R S P E C T I V E



THE FUTURE
IS YOU



SOCIETE GENERALE
Securities Services

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WELCOME TO THE TOKEN WORLD

Three years ago, SGSS published its first Blockchain magazine. This was a few months after a major report had been published on the changes that blockchain technology would bring to financial markets, reducing the need for reconciliations and bringing many billions of annual savings¹ to the financial industry.

At the time, SGSS' conclusions were that the Distributed Ledger Technology introduced by the Bitcoin could be a fit for a public decentralised ungoverned currency and that it would require several evolutions to become fit for the financial markets. Firstly, the **scalability** issue to process the volume, secondly the **confidentiality** issue to keep transactions private, and thirdly the **regulation** and **governance** issue to offer the same level of protection as current markets.

SO MANY ICOS, SO LITTLE ECONOMIC IMPACT

The past three years have seen the launch of thousands of cryptocurrencies, often through an Initial Coin Offering (ICO) process. Andy Warhol said: "in the future, everyone will be world-famous for fifteen minutes"²; it is now possible to create a cryptocurrency in fifteen minutes and possibly become famous. However, cryptocurrency issues have generated little interest from regulators because of their relative small size compared to the global economy. The global value of cryptocurrencies is around one hundred billion euros³. Just taking the euro currency alone, its fiduciary⁴ value is ten times larger⁵ and the euro supply is about one hundred times larger, so cryptocurrencies do not currently represent a systemic risk.

FROM COIN TO TOKEN

Inceptors of cryptocurrencies have tried to improve the technology to overcome the three main issues just mentioned. Most initiatives in financial services have, in various ways, reduced their scope to **private, permissioned** and **partially recentralised** technology in order to progress in the digital representation of assets. Financial regulators are showing themselves to be pragmatic, authorising issues on a case-by-case basis or on a sandbox basis.

(1) Profiles in Innovation Blockchain by Goldman Sachs in May 2016, p. 5. (2) 'How to create your OWN cryptocurrency in 15 minutes'. (3) 120 billion euro market capitalisation for all cryptocurrencies on 14 March 2019. (4) In this context, fiduciary money means banknotes and coins. (5) banknotes and coins represent €1,034 billion, and total euros in circulation account for €11,618 billion.

The interest has now shifted from coin to token. From an initially complex taxonomy of tokens, only three are kept in focus: currencies⁶, utilities⁷ and **securities**⁸. Focusing on securities, security tokens have a clear issuer, which is not the case for the Bitcoin. This is why regulators want these issuers to apply to tokens the **existing regulations covering their underlying assets**. In Europe, they are making a clear distinction between securities and financial instruments, because they are subject to different regulatory frameworks.

The buzzword is Security Token Offering (STO). There are solutions to issue and maintain a registry of holders for bonds, equities or funds. The next challenges will be the ability to manage corporate events and to organise efficient secondary markets.

INTO THE TOKEN WORLD

In the mind of operators, a digital representation of assets allows a better circulation of assets, what they call a **greater velocity**, the capacity to exchange assets almost immediately. Taking a real estate example, buying a property takes weeks. Buying tokens representing shares of a company holding a property would take only minutes. Furthermore, if the token is properly designed, it could take little time to **bundle** this property with another one or, on the contrary, to **split it into parts**, bare ownership and usufruct, or into fractions. In other words, securitisation and stripping made easy.

In these transactions, the trading, the settlement and subsequently the safekeeping of the representation of the asset could be done at once. Such immediate processing would require the use of a standard unit of account linked to one of the main existing currencies, and this is the reason why there is such enthusiasm for **stable coins**⁹ and whether to use them in Exchanges or for Registries.

(6) A token that is as a store value and as a medium of exchange, not issued by a central Bank. (7) A token linked to a network or to an issuer to fund a project and later gives right to goods or services. (8) A token behaving like a security with holders regarded as owners. (9) Please read the article: Stable coin; the next big thing on page 10 of this magazine.



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BACK TO THE REAL WORLD

Issuers and investors need to know and apply the requirements of all applicable laws, regulations and tax systems. This includes identifying counterparties (KYC), checking the origin of funds (AML), making declarations of threshold crossings, checking foreign ownership restriction, as well as reporting capital gains, or even withholding tax. This applies to security tokens too.

Considering the number of initiatives, these digital markets will stay fragmented for several years before a cross-chain of integration is built or before a leading platform emerges. In the meantime, it seems necessary to rely on trusted intermediaries to provide a single interface for all these chains, convert cash to and from these chains, to safeguard the keys to access them or even hold the tokens themselves.

Imagining this world of digitisation is quite easy. Guaranteeing the reality of the assets represented by the tokens, and possibly their condition, or understanding the rules or assessing the fairness of a joint ownership agreement, would be additional services required by counterparties.

ONE STEP AT A TIME

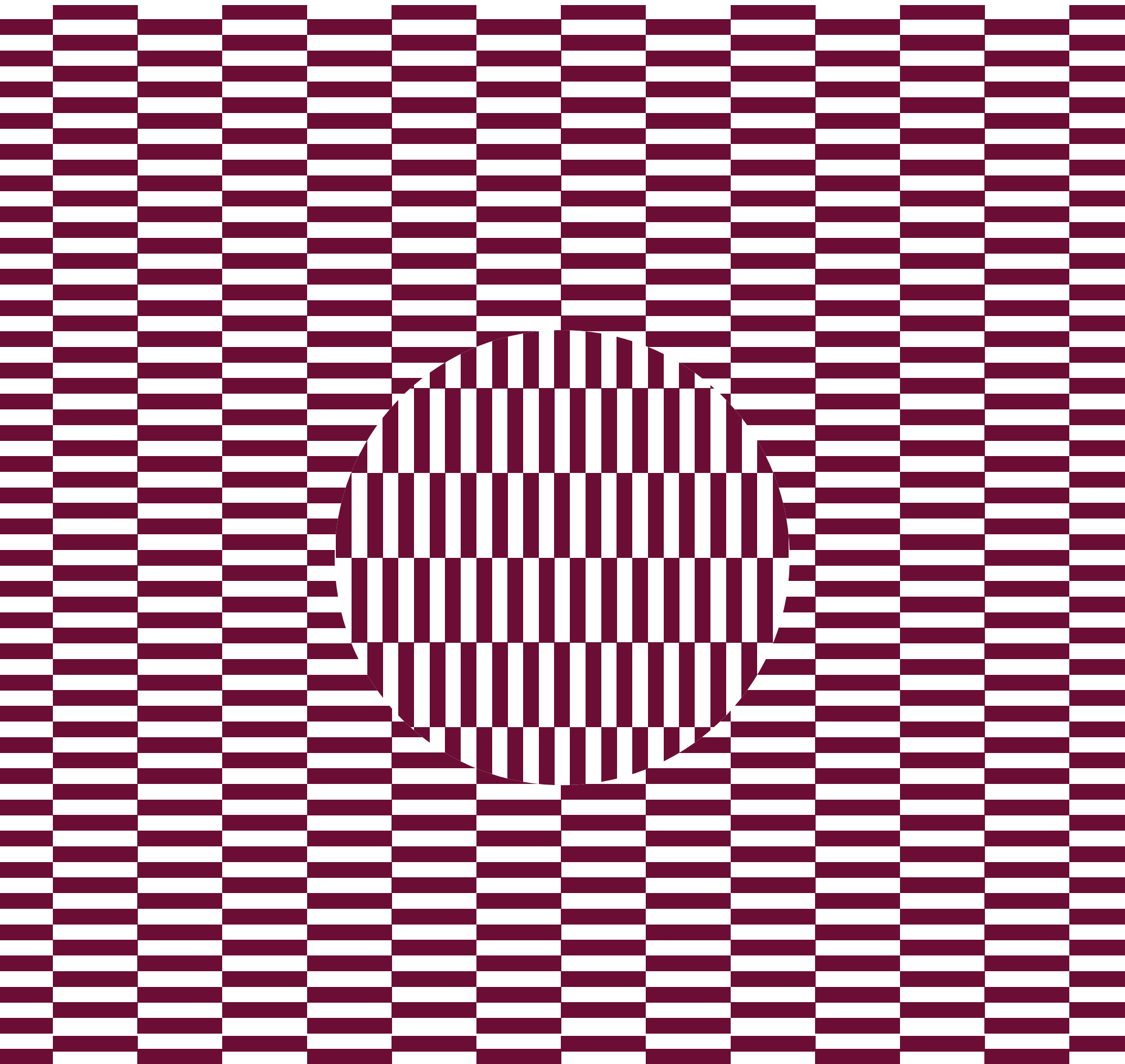
Just like Artificial Intelligence, Blockchain is having a clear impact on the Financial industry. The purpose of this magazine is to better understand these changes by sharing views on the technology's progress, how it might impact the investment management world and how the regulators will accompany these new topics.

Finally, we sincerely thank all the authors for their contribution to this magazine.

Wishing you good reading !

"THEY ALWAYS SAY TIME CHANGES THINGS, BUT YOU ACTUALLY HAVE TO CHANGE THEM YOURSELF"

Andy Warhol



**DO YOU
SPEAK
TOKEN?**

ASSET TOKENISATION

WHAT IT IS AND WHY IT WILL REVOLUTIONISE FINANCIAL MARKETS

Unnoticed by many, innovations in financial services have shaped large parts of the world as we know it today. Most notably, the invention of the joint stock company as well as the stock exchange had lasting geopolitical effects on a global scale. The ramifications of these novelties that led to a democratisation of capital markets can still be felt today. At present, we see ourselves confronted with new developments that are likely to be as revolutionary as was the introduction the joint stock company and the stock exchange: asset tokenisation. Going forward this new concept will unlock massive values globally and will help to create more efficient and fairer capital markets.

DISTRIBUTED LEDGER TECHNOLOGY AND TOKENISATION

It can be argued that, with the arrival of tokenised assets, we are at the dawn of a development similar to the introduction of the joint-stock company and the opening of the first stock exchange in 1602. Asset tokenisation converts rights to an asset into a digital token. While the process itself is similar to asset securitisation, tokenisation makes use of Distributed Ledger Technology (DLT), most notably the blockchain. This technology provides five major advantages over conventional technology employed by financial services firms. First, DLT provides greater transparency to all parties, as they share identical documentation that can only be updated via a clearly-

defined consensus process. Secondly, this innovative technology provides better means of traceability, as every transaction is recorded and stored simultaneously on a vast number of nodes, and is thus auditable. Along with the first two features goes the third advantage of DLT, namely enhanced security. DLT is more secure than traditional means of recordkeeping, as transactions must be agreed upon before they are recorded and are immutable ex post. These features also lead to the fourth advantage of DLT: it typically increases efficiency and speed, as it largely does away with paper-based processes and human error. Last but not least, it regularly reduces costs, as it streamlines processes and reduces the number of parties involved.



Terencio Gonzales - Let's go - 2017 - Technique mixte - 146 x 130 cm - Courtesy Collection Société Générale

APPLYING DISTRIBUTED LEDGER TECHNOLOGY TO FINANCIAL MARKETS

While the advantages of DLT may sound somewhat abstract at first, they become more tangible if we put them in the context of capital markets. Deploying DLT to the world of finance yields numerous benefits, among others these five: firstly, we will observe an increased degree of disintermediation, i.e. a reduction of middlemen.

“THE HURDLES FOR TOKENISING AN ASSET IN ORDER TO MAKE IT TRADABLE ON A DLT-POWERED FINANCIAL MARKET ARE EXTREMELY STRAIGHTFORWARD AND INEXPENSIVE FROM A TECHNICAL POINT OF VIEW.”

Theoretically, we no longer need a bank, a broker and an exchange, as buyer and seller can directly interact with each other. Secondly, we will experience higher execution speed, as DLT reduces the number of middlemen and shortens settlement times. Thirdly, any investment opportunity can obtain global market exposure. Virtually anyone with access to the Internet can participate, within the given statutory limits, in virtually any investment opportunity, independent of geographical presence. Fourthly, investment projects will enjoy larger crowds of investors, as new investor segments can be reached. Investment opportunities currently restricted to a few wealthy individuals, such as art or gemstones, can be made available to anyone. Fifthly, DLT has the potential to significantly reduce market manipulation, as every transaction is transparently recorded in real-time, shared, immutable, auditable, and at all times accessible to all stakeholders, including the regulators.

The hurdles for tokenising an asset in order to make it tradable on a DLT-powered financial market are extremely straightforward and inexpensive from a technical point of view. At the same time, the benefits of making an asset tradable should not be underestimated. In his seminal paper “Marketability and Value: Measuring the Illiquidity Discount” (July 2005), Aswath Damodaran explicated that a publicly traded company displays a 20-30% liquidity premium over a non-publicly traded company. This liquidity premium is due to higher market efficiencies resulting from ceteris paribus more market participants, higher trading volumes, smaller spreads and a lesser price impact. Given this line of argument, the case for asset tokenisation becomes rather compelling: everything else remaining equal, an asset will increase in value if it is made tradeable.

REAL-WORLD EXAMPLES

Already today, various examples of tokenised assets exist, covering as diverse areas as real estate (e.g. Property Coin), commodities (e.g. Oil Coin), diamonds (D1 Coin), gold (digix coin), art (e.g. Maecenas), luxury goods (e.g. Tend) and national currencies (e.g. Tether). Another case in point is the blockchain-based platform Bitcar, which provides fractional ownership of a portfolio of exotic cars. Hence, instead of owning one single vintage or sports car yourself, you can buy into an entire portfolio of such cars. What may look like a rather eccentric investment at first glance has a serious economic background: collectable exotic cars have been one of the best performing asset classes over

the last decade. The tokenisation of such cars opens up an asset class to an investor segment that until now could not afford buying into it. But the investor is not the only one profiting from asset tokenisation, the seller of the assets also benefits from the new arrangement. Imagine the owner of a piece of art who needs liquidity at short notice: she could now sell half of her painting to a crowd of art enthusiasts. Or think of the owner of an SME who would like to retire gradually. Now, thanks to asset tokenisation, he could conduct a public offering that investment banks would have previously priced as prohibitively expensive. Via a so-called Security Token Offerings (STO), the art owner as well as the company owner could now tender their assets, or parts thereof, to any investor globally.

These new offerings in the world of security tokens are furthermore complemented by an entire range of service firms, providing asset tokenisation, emission, and trading as a service such as STOGlobalX. Moreover, an increasing number of incumbent players are now venturing into the field, providing those bits and pieces of the infrastructure which are necessary to create a lasting ecosystem for tokenised assets and security tokens: Fidelity Investments, for instance, announced to establish a subsidiary providing custody and execution for digital assets. Falcon bank now offers a digital wallet to store tokenised assets. The Swiss Stock Exchange proclaimed its objective of establishing a regulated trading platform for digital assets¹. Lloyd's of London has widened its product offering to insure custodians holding digital assets for their clients. This list of developments is not exhaustive.

CONCLUSION

The sum of total global wealth is currently around USD 317 trillion². Discounting for exchange-traded financial products, and thus only assuming a liquidity premium of 10 %, more than USD 30 trillion in value could be unlocked by making assets more fungible. In the years to come, asset tokenisation will be the method of choice to do exactly that. Moreover, those countries that embrace this new concept and democratise capital markets will obtain a strategic advantage over other nations. Those countries fostering asset tokenisation may shape the future of the world as did those who first embraced the notion of the joint stock company and the stock exchange in the past.

(1) <https://www.six-group.com/en/site/digital-exchange.html>, July 2018.
(2) According to Credit Suisse Global Wealth Report 2018.



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STABLE COINS: THE NEXT BIG THING?

Money has always been at the heart of the economy, with the purpose of facilitating commercial trade. Money has taken physical forms such as coins, notes and gold, but also electronic and more recently digital forms¹.

The common denominator of money is its adoption. In *Money and the Mechanism of Exchange* (1875), William Stanley Jevons analysed money and gave it four functions: a medium of exchange, a unit of account, a standard of value and a store of value. Ten years after the creation of the first digital currency “The Bitcoin”, we have witnessed the launch of more than 2,000 cryptoassets and cryptocurrencies (Bitcoin, Ethereum, Ripple, Litecoin...). The strong volatility of cryptocurrencies since their inception is a hurdle to its development from a consumer perspective but also from a corporate one. The daily valuation that often changes by more than 20% fuels cryptocurrencies as a speculative asset. Would you use a cryptocurrency as your official means of payment if you risked paying twice as much for your pizza in a month's time?

In this context, stable coins are of major interest to all industries. The increasing investment from Venture Capitalists in different projects is a clear sign of this².



Turiya Magadala - Walking Towards God III - 2017 - Technique mixte - 120 x 120 cm - Courtesy Collection Société Générale

WHAT IS A STABLE COIN?

A stable coin is easily definable as a stable cryptocurrency. It is primarily a response to the problems of volatility and enables money's function to be fulfilled. To achieve stability, more than 50 stable coins³ have proliferated using different methodologies:

■ **Fiat currency-collateralised** i.e. a cryptocurrency pegged to a legal tender currency, also called **fiat currency** in cryptojargon, or a basket of legal tender currencies. Most of the cryptocurrencies have a stable value of USD 1. The entity that issues the stable coin opens a banking account and mirrors the position. For example, if the entity issues 1 million coins pegged to the USD, they need to credit the banking account with USD 1 million. This could be considered as the simplest stable coin model and is very stable. This model requires centralisation and therefore a trusted custodian with a need to audit for transparency. The Tether, which is one of the most popular in this category with a market capitalisation of USD 2 billion, is listed on more than 65 cryptoexchanges⁴.

■ **Commodity-collateralised** i.e. cryptocurrency guaranteed by a commodity. The operating model is quite similar to the fiat one. Several initiatives have been launched in this space, especially in Gold. It is inspired by the Bretton Woods system.

■ **Cryptocurrency-collateralised** i.e. cryptocurrency guaranteed by another cryptocurrency. The whole process is done within the blockchain, contrary to fiat currency and commodities, where a custodian is needed to safeguard the collateral off chain. This model has the benefit of decentralisation, as the collateral is held in a smart contract. However, cryptocurrencies, being unstable, require over-collateralisation to absorb cryptocurrency fluctuations.

■ **Non-collateralised.** It is supported only by its value thanks to a smart contract that runs automatically. If the total offer or demand of the stable coin is increasing or decreasing, the smart contract will automatically adapt the number of coins in circulation to keep the price unchanged.

The asset-collateralised stable coin is the dominant model, and represents, in value, 83% of initiatives, which mostly run on an Ethereum protocol⁵.

WHY ARE STABLE COINS SO ATTRACTIVE?

The stability of stable coins reassures the whole industry, retail investors as much as institutional investors.

They are built in such a way that global participation and near real-time transfer are possible, in seconds or minutes instead of days. To secure an exchange, most financial transactions are made Delivery Versus Payment (DVP). For the time being, there is no fiat currency in the cryptoworld. This prevents efficient DVP exchange in the Blockchain.

Until a fiat currency is available, a stable coin pegged to a fiat currency is one of the best answers, bringing efficiency to the value chain. Many Blockchain initiatives in the post-trade industry would benefit from this introduction. Moreover, it has the potential to be adopted as a real cryptocurrency from a macro economy perspective.

There is great potential for a number of countries in a situation of hyperinflation or monetary instability (Venezuela, Argentina, etc.) where the stable coin might become an alternative. From a trading perspective, the stable coin will be a good alternative, allowing them to add a new pair. A number of cryptoexchanges do not accept fiat currency yet, and stable coins can help better manage the risks. During her speech⁶, Christine Lagarde, Managing Director of the IMF (International Monetary Fund) even mentioned the possibility of the IMF taking greater control in this domain, including issuing its own cryptocurrencies whose exchange rate would be governed by macroeconomic mechanisms. Governments around the world are prototyping and testing their own digital currencies. They have definitely acknowledged the potential of DLT technology with the trust of their national bank currency. This is what we call the Central Bank Digital Currency (CDBC). Different projects are already public, like in the UK, Sweden, Singapore and Switzerland.

WHAT ARE THE KEY CHALLENGES FOR STABLE COINS? AND LASTLY WHAT ARE THEIR FUTURES?

KYC is still the cornerstone of all stable coins projects, especially due to their volume to capitalization ratio that is substantially higher than traditional cryptoassets. Tether's 30-day volume is similar to that of the Bitcoin whereas its market capitalisation is on average 30 times less valued. A good management of all aspects of KYC elements is crucial to its efficiency. JP Morgan, through their JPM Coin, and, Facebook⁷ have also launched initiatives in this context. That shows the appeal and potential of stable coins. Despite substantial interest from the regulators and the industry as a whole, we are still at the beginning of the journey. There are still clear structural and regulatory concerns to be addressed.

We need to keep in mind the role of money; **TRUST** will be the answer.

(1) Using digital for cryptocurrencies. (2) <https://www.bloomberg.com/news/articles/2018-10-29/stable-coin-backed-by-circle-coinbase-draws-most-early-demand> (3) <https://www.coindesk.com/the-secs-crypto-czar-is-hitting-the-road-and-she-wants-to-meet-you>. (4) <https://coinranking.com/coin/tether-usdt> (5) https://www.blockchain.com/static/pdf/StablecoinsReport_2_21_2019.pdf (6) <https://www.bbc.com/news/business-46203869> (7) <https://coin24.fr/actualites/facebook-va-t-il-revolutionner-le-monde-des-crypto-monnaies/>



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ECOSYSTEM & NEW ENTRANTS

Do you remember Napster? Founded in 1999, the peer-to-peer file sharing service created a stir in the world. It allowed users to share audio files with each other, thereby undermining copyright. Nobody really talks about Napster anymore. But the idea of playing music from the internet has supplanted classic records sales. What Napster represented for the music industry is comparable to how Bitcoin will come to be seen for the economy at large, and especially the Financial Services Industry: the first flicker of a big idea. Blockchain and distributed ledger technologies are leading to two fundamental shifts: the way business is conducted, and how value is recorded, stored and transferred.

DLT, MORE THAN A TECHNOLOGY: A NEW WAY OF THINKING AND WORKING

Ecosystems and Consortia are the new reality. By its very nature, and in order to reap the benefits of this technology, Blockchain will force all players to rethink their role in the value chain and where they intend to position themselves in the new environment. Some technologies – spreadsheets to take one example – are valuable in the hands of a single user. Others require buy-in from many users, both partners and competitors, with their value increasing as more parties sign on. Although a distributed ledger can have an immediate positive impact even between two businesses, it derives more utility from network effects: “The greater the number of users, the more valuable the technology is to all

of them. Consortia allow companies to take advantage of blockchain network effects immediately¹, by providing a vehicle to create a governance structure around this collaboration, often among players that compete against one another. Consequently, to use blockchain effectively and for its promise to become true, most enterprises need to be, and increasingly are, part of a consortium. At the same time, promising research shows², banks that decide to shift their strategic mindset to an ecosystem approach and “successfully orchestrate a basic ecosystem strategy, by building partnerships and monetising data, could raise their ROE to about 9 to 10 percent”.



Stéphane Couturier - San Diego - Fenêtre East Lake Greens - 2002 - Photographie - 245 x 190 cm - Courtesy Collection Société Générale

THE TOKENISATION REVOLUTION

The second major shift in Financial Services, and the Economy, is represented by digital assets and Tokenisation. It has the potential to reshape global financial markets and will fundamentally change the way we register, store and transfer value and assets. Ultimately, we are observing the birth of an internet of value, which will follow the current internet of information, making the transfer of an asset as simple and frictionless as sending an email. All types of assets can and will be represented by tokens, and we are already observing the emergence of smart securities. Digital or smart securities transform the capital formation process by automating costly compliance requirements through a transparent and immutable ledger. Additional benefits include 24/7 global markets, cost reductions, increased liquidity and rapid almost real-time settlement, allowing for improved risk management.

WHAT ARE THE BARRIERS TO ADOPTION, AND WHICH PLAYERS ARE EMERGING AS LEADERS IN THE DEVELOPMENT OF SOLUTIONS? ...AND WHAT'S NEXT?

In order to fully unfold its potential, the emerging tokenised economy needs a trusted, comprehensive and regulatory-compliant ecosystem; an integrated ecosystem around digital assets, developed by strong and experienced partners, to enable institutional investors to tap into the new asset classes and accommodate all client needs. Swisscom, the leading Swiss Information and Communication Technology (ICT) company, identified early on the potential of distributed ledger technology as well as the two shifts towards ecosystems and digital assets. For this reason, Swisscom is working on a comprehensive solution for the issuance, registration, storage and transfer of digital assets via the blockchain, together with partners. As was recently announced³, Deutsche Börse Group, one of the world's largest market infrastructure providers, is

joining the efforts and, together with Sygnum (a Swiss and Singapore-based financial technology company), a new strategic partnership was established. The aim of this cooperation is to jointly build out and grow a trusted and regulatory-compliant financial market infrastructure for digital assets. The core elements of the solution will include issuance, custody, access to liquidity and banking services – all leveraging Distributed-Ledger-Technology (DLT). Two main components of the infrastructure are already well advanced: the issuance platform, Daura AG (with a current focus on Swiss SMEs), and Custodigit AG, the digital assets custody platform, which also provides access to exchanges and markets. Daura AG, a joint venture by Swisscom and MME, a leading law firm, has developed a platform that uses Distributed Ledger Technologies to issue digital assets and to securely transfer and register Swiss SME shares, enabling non-listed companies to access the capital markets. Custodigit AG was founded in 2018 as a joint venture by Swisscom and Sygnum. Custodigit AG provides a digital asset custody solution for regulated financial services institutions. The integrated platform allows bank customers to manage the entire life cycle of their digital assets. The above developments are a clear sign that the ecosystem reality is already here, and it is expected to accelerate substantially in the coming years.

(1) Deloitte, Emergence of blockchain consortia, 2017. (2) McKinsey, 2018. (3) Deutsche Börse Group, 2019 March 11



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GEEKS CORNER



ETHEREUM STANDARDS: A WORK IN PROGRESS

By Etienne Deniau

Ethereum has the largest blockchain developers' community. Standards for interoperability for tokens are discussed and decided within this community¹. Here is an overview of the main functional standards.

ERC-20: ERC-20² is considered as the minimum set of functions for a token. It basically enables to check the total number of tokens or to check an **account balance**, to make a **transfer**, to authorise and to make a **direct debit**.

ERC-777: ERC-777³ is designed to be compatible with ERC-20. It introduces the concept of 'Operator', a **proxy** who is authorised to send tokens from an account. A smart contract is an Operator.

ERC-1400: this standard⁴ whose purpose is to handle securities is still being discussed. It is compatible with ERC-20 and it should be compatible with ERC-777. It has four new subsets of functions:

- The core securities subset makes it possible to **issue** and to **redeem** securities, but also to definitively stop issuing more securities.
- The document management subset allows to set and retrieve **off-chain documentation**.
- The controller operation subset introduces a **higher authority** that has the right to force a transfer or a redemption of tokens.
- Finally, each token belongs to a partition to manage **restrictions on transferability**, for instance a dependency on a lock-up period or on meeting KYC requirements.

Thus, the ERC-1400 standard is not yet tackling any corporate events.

These standards constitute a **very basic framework** to transfer token and to issue them only. **It requires very substantial improvements to properly handle secondary market operations.**

(1) <https://ethereumworldnews.com/ethereum-eth-development-2019/> (2) <https://eips.ethereum.org/EIPS/eip-20> (3) <https://eips.ethereum.org/EIPS/eip-777> and <https://github.com/ethereum/EIPs/blob/master/EIPS/eip-777.md> (4) <https://github.com/ethereum/EIPs/issues/1411> and <https://blog.polymath.network/erc-1400-evolution-of-a-security-token-standard-1e25d12b9261>

REINVENTING CONFIDENTIAL INTERMEDIATION WITH SECRETARIUM

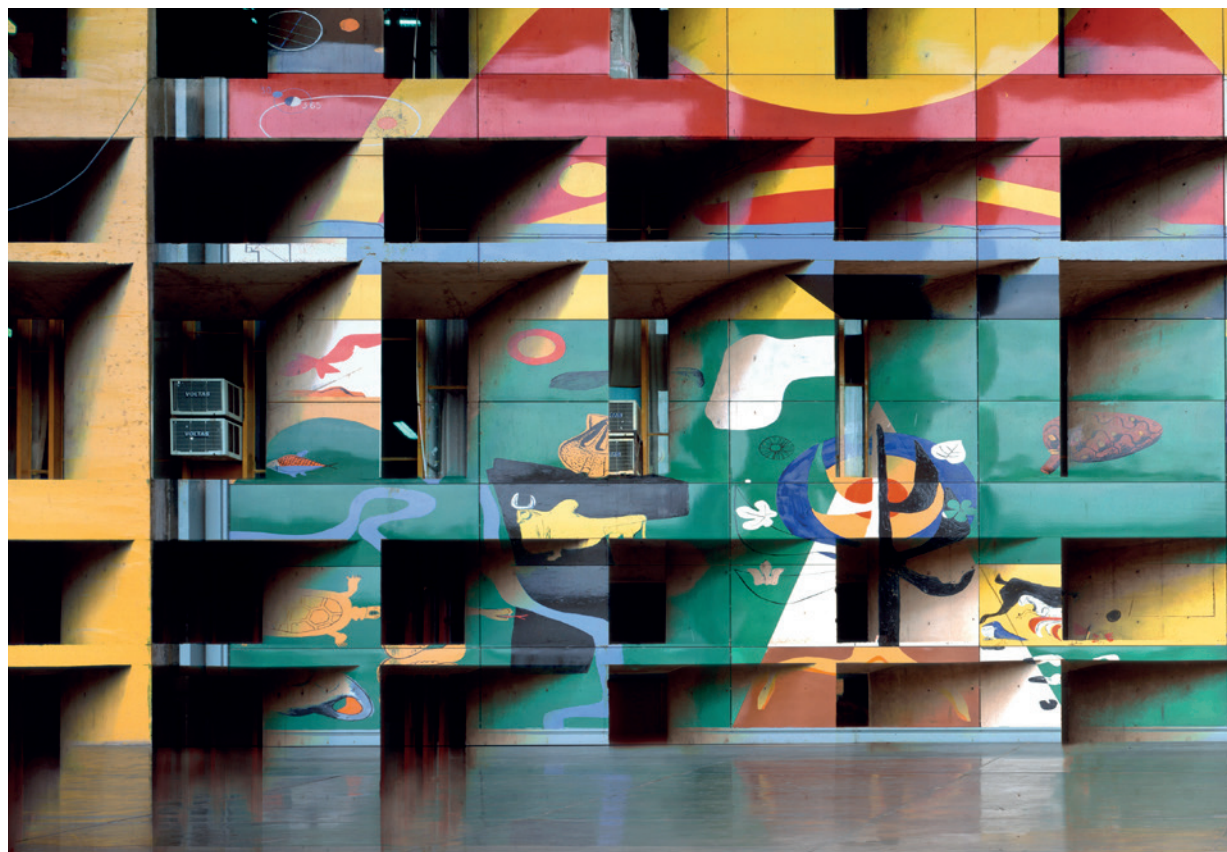
THE TOKEN WILD WEST

Crypto-token fever has taken the world of finance by surprise. Blockchain pundits promised there would be impartiality with few or no intermediaries, free custody, no barriers to trading, no currency control and no tax.

Undeniably, custody and asset transfers are cheap in the crypto-world but, a few years on, the future is somewhat less rosy than promised. Lack of regulation has allowed questionable tokens to flourish. Crypto-exchanges such as QuadrigaCX continue to go bankrupt¹, engulfing their clients' assets in the process. Moving in and out of fiat currencies still constitutes a money laundering risk. The world of crypto-tokens is largely an unregulated cut-throat one. And yes, one must pay one's taxes.

TOKEN GATEWAYS ARE CENTRALISED

It is important to note that the central institution of tokens is not the blockchain itself, it is the crypto-exchange. Crypto-exchanges allow buy-side vs. buy-side direct trading, hence their appeal to the fund management world. These are highly centralised institutions, yet, they are unregulated when they don't trade in fiat currencies. They are inevitable because something needs to be entrusted with an indication of the interests of all parties in order to match them. Crypto-exchanges require custody of the assets to function, thus leading to a custody risk as unregulated institutions. Asymmetric access to the information allows client front-running, or leaking trading information to selected parties. Regulation to enforce the impartiality of these new intermediaries is now well overdue.



Stéphane Couturier - Chandigarh - Assemblée #1 - 2007 - Photographie - 100 x 130 cm - Courtesy Collection Société Générale

PARTIALITY OF CRYPTO-EXCHANGES

But surely - one would think - blockchain's technical impartiality itself could be leveraged to create truly impartial exchanges. But it cannot. Institutions such as crypto-exchanges cannot run on a blockchain for several purely-technical reasons, including privacy, performance and determinism.

Consider the case of privacy: public blockchains do not provide anonymity; they provide pseudonymity at best.

And where would information such as your name, address, email address, bank account details be stored? As far as data is concerned, once your data is uploaded to a public blockchain, it is there for everyone to see forever, so much for GDPR compliance!

SHARING WITHOUT SHARING

But what if a cryptographic platform could allow automation without sharing any data at all? What if we could have the same services as those provided by an impartial law firm, but walled up in a Swiss bank safe with no means of leaking data? This is precisely the value proposition of automated confidential intermediation.

With such a platform, building an impartial and privacy-preserving crypto-exchange becomes possible. In fact, many existing disintermediation problems can be solved directly, thus obviating the need to jump into the token world in the first place.

APPLICATIONS IN ASSET MANAGEMENT

- A broker-free buy-side vs. buy-side anonymous interest matching platform, with controlled information disclosure and incentivisation of parties to reach a trade.
- A platform to corroborate views on the value of illiquid assets, incentivising the anonymous exchange of opinion for opinion, and creating index benchmarks for these assets.
- A client data pool to measure ownership concentration, enforce embargoes, prevent mis-selling, perform marketing statistics... whilst enforcing GDPR and not disclosing client data.
- A secondary market facility directly in fiat currency, automating transfer of shares in private equity, venture capital, fund shares... whilst provably enforcing taxation and keeping records of ownership.

MAKING CONFIDENTIAL INTERMEDIATION REAL

This engineering feat is achieved through a combination of three core technologies:

- Reuse of blockchain's concepts to maintain the integrity of a ledger and give back control to its participants.
- Secure multi-party computing, which is a cryptographic protocol used to collectively provide insight on the data without disclosing that data.

- Secure hardware, such as Intel SGX, assembled in a secure peer-to-peer network.

This latter technology is pivotal to providing secure multi-party computing at scale and allowing non-determinism without compromising impartiality. Furthermore, the Secretarium platform is designed to guarantee finality of execution within a split second and integrates with banking systems, mobile phones and internet browsers as they exist today.

THE BLOCKCHAIN IMPASSE. WHAT'S NEXT?

As the lead for a blockchain lab, I have witnessed several projects hit the brick wall of either privacy, determinism, or performance. Products such as Corda or Quorum offer interesting compromises making them suitable to solve post-trade automation issues when a controlled transfer of information with select parties is permissible. However, they might not be well-suited when it comes to solving the performance and total privacy issues, especially in the pre-trade world.

Coming back to the blockchain and token hype: we are now past the peak of inflated expectations, and the trough of disillusionment has begun. This doesn't mean that all its promises will come to nought. After the 1998 LTCM² crisis and the emerging market crisis, everyone swore not to touch derivatives or emerging assets again. But everyone did. Similarly, there was a dotcom bubble that eventually burst, but now the dotcom industry is thriving³.

“WHEN IT COMES TO B2B BUSINESS PROCESS AUTOMATION, A GREAT NUMBER OF THESE BLOCKCHAIN PROMISES WILL BE KEPT... BUT THEY WILL BE SO WITH CONFIDENTIAL INTERMEDIATION. BLOCKCHAIN ALONE WON'T DO THE TRICK.”

“THE ONLY SECRETS ARE THE SECRETS THAT KEEP THEMSELVES”

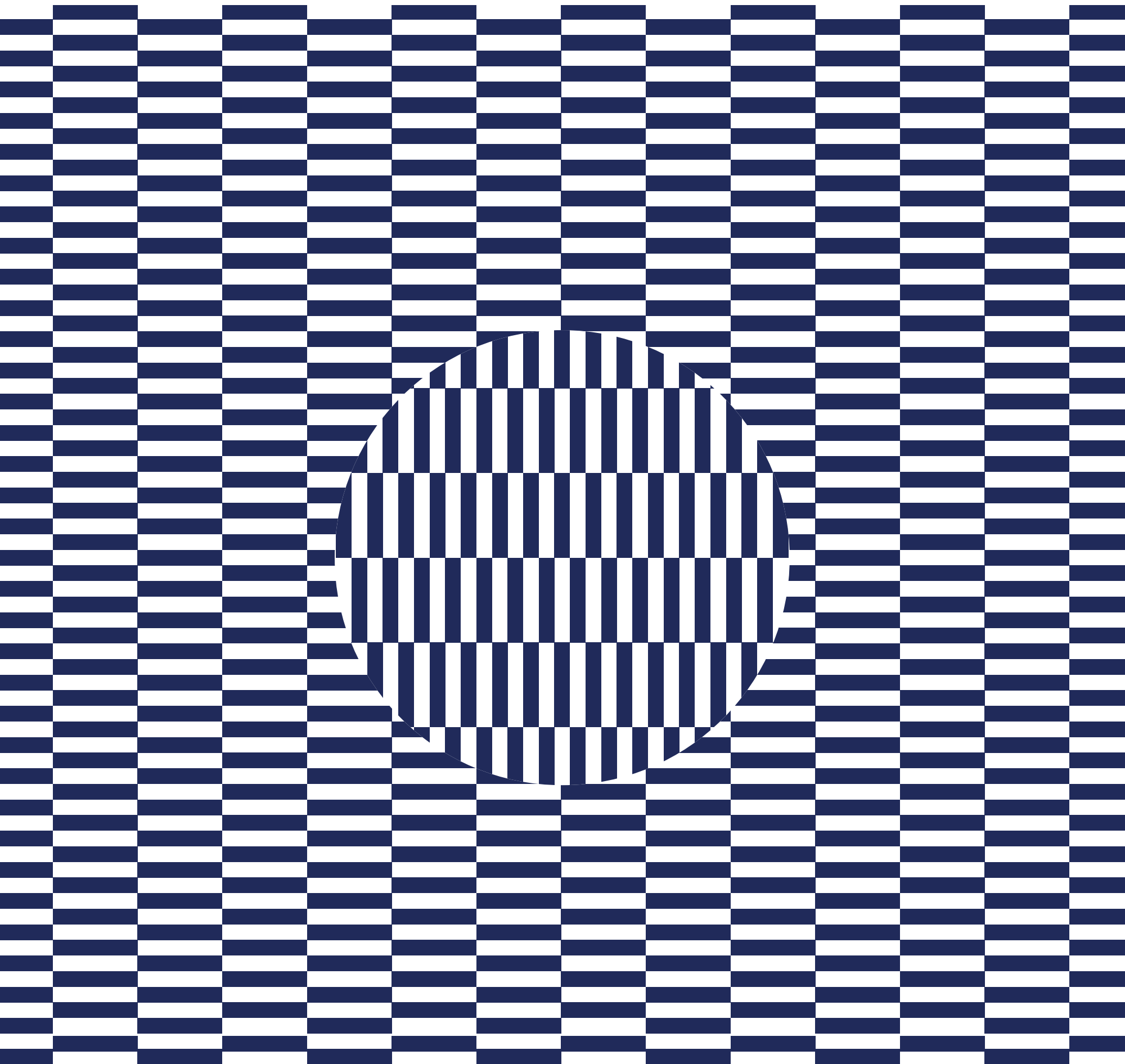
George Bernard Shaw

(1) <https://www.cbc.ca/news/>, 2019 April 8 (2) Long Term Capital Management. (3) <http://news.bbc.co.uk/2/hi/business/8558257.stm>



CEDRIC WAHL: after graduating with an MEng in Applied Mathematics from Mines ParisTech (a French Grande Ecole), Cedric worked for 20 years as a software engineer and an IT project manager, including 14 years with Societe Generale in structured fixed income derivatives risk management.

He is the founder of the Societe Generale's Blockchain Lab in the UK and the founder, with Bertrand Foing, of Secretarium Ltd, a confidential computing tech start-up incubated by Societe Generale in the UK.



TOKEN

WHAT'S IN
IT FOR ME?

DIGITAL ASSETS

THE TRUE INVESTMENT OPPORTUNITY FROM AN INVESTOR'S PERSPECTIVE

Over the past few decades, technology has been an increasingly attractive investment opportunity for investors. While still in its early days, it is fair to say that blockchain technology is one of the most exciting innovations we are currently witnessing. It is a new paradigm that has the potential to disrupt most industries, from financial services to supply chains. On the one hand, it can reduce costs, streamline “traditional” distribution channels and remove the need for “trusted” intermediaries; on the other hand, it enables automation, decentralisation and transparency through its smart contracts¹ and public ledger capabilities.

BLOCKCHAIN IS BEING PRIORITISED

Blockchain technology is not a fad and is most likely here to stay. Though innovation is mostly endorsed by start-ups in the space, a growing number of large corporations are evaluating the business opportunity and potential synergies at stake. According to a Deloitte survey² conducted in 2018 amongst 1,000 executives from nine industries and seven countries, 74 percent

of respondents reported that their organisations see a “compelling business case” for the use of blockchain. For most organisations surveyed, blockchain is becoming a priority investment, 95 percent of companies surveyed are investing or intend to invest in this nascent technology.



Aleix Plademunt - Espectadores 3 - 2008 - Photographie - 120 x 150 cm - Courtesy Collection Société Générale

THE POLARISED VIEWS OF THE MARKET

Whilst most would agree that blockchain technology has merit and multiple applications, the jury is still out on the role of Digital Assets or tokens. As always with innovation, it is not straightforward to fully appreciate the opportunity and implications for the future. When it comes to blockchain, this is even more true, as a very limited number of people have a sufficiently in-depth understanding of it; in most cases, people simply don't understand its purpose.

The articles in the media generally outline two opposite “extreme” beliefs:

- Those who believe that blockchain technology is going to change the entire world. Beyond the financial industry applications that most potential investors are aware of, it is believed Digital Assets can impact social order, the balance of power, wealth, opportunity as well as things like censorship, transparency and many more of the ways we interact with each other.
- Those who believe that there is no such revolution on the horizon and that the financial system will continue to function as it always has. The role of Digital Assets is limited in society. Social order will not be changed but blockchain may have applications within some industries to increase efficiencies.

We position ourselves somewhere in the middle and believe that, while there is a strong use case for many industries, corporations should spend time reviewing current processes and determine whether blockchain technology can improve their operations. We also believe the role of Digital Assets will continue to grow in the financial markets.

INVESTING IN A NEW ASSET CLASS

We have seen a substantial amount of research done by applying traditional valuation analysis to Digital Assets. While analysts tend to draw conclusions based on such analysis, the reality is that applying these models to Digital Assets is most likely impractical or at the very least questionable – we can put together analysis to prove that either blockchain “evangelists” are correct or that blockchain pessimists are correct, depending on the time period and performance metrics we choose to

consider. The key point for an investor is that we aren't really gaining any meaningful insight from this, as the market is in its early stages and is dynamically evolving.

Making an investment decision based on your prediction of what will happen in the next year is extremely risky. For an investor with a diversified portfolio and sufficient funding to meet their investment objectives, the case for investing in Digital Assets with a short-term investment horizon is unclear.

Investors that are able to take a longer-term view are better placed to benefit from the opportunity. The progress made each year is astonishing, and there is much to be optimistic about, the details of which go beyond this article but a high-level overview is as follows:

- Regulation is coming. It might be slow, but every year the framework for a balanced outcome that promotes innovation is developing, and this is a good sign for a longer-term investor.
- Education and awareness of the asset class is increasing. From an investor's standpoint, we have gone from something geeks and criminals play around with to something that financial institutions are participating in.
- Infrastructure for mainstream adoption and investment is being built – with many of the largest financial institutions involved.
- True diversification – for most investors this will be their only investment outside of traditional financial markets.
- Appreciating and adapting to the evolution of society towards the values that are important to millennials and how this will shift macro trends.

Many investors regretted missing the opportunity of investing at the price levels of 2017, with many having no knowledge of the asset class at the time. Those prices are now being revisited with Bitcoin back at the price levels of August 2017 (c.\$4,000) at time of writing³. However, this time the asset class has more than a year of extra progress in terms of infrastructure, development and regulatory framework. The case for investing in Digital Assets continues to look compelling, and it is becoming very difficult for investors to ignore it.

(1) Smart contracts help you exchange money, property, shares, or anything of value in a transparent, conflict-free way while avoiding the services of a middleman. (2) Source: Deloitte, 2018 Global blockchain survey, Breaking Blockchain Open – sample size = 1,053 global companies (3) <https://www.coinbase.com/price/bitcoin>



ASIM AHMAD, Head of Portfolio Management of Eterna Capital. Asim was previously a member of BlackRock's Institutional Client Business team working in a solution-orientated role with global and UK based investment consultants. Prior to joining BlackRock, Asim was an investment consultant at JLT, where he advised institutional

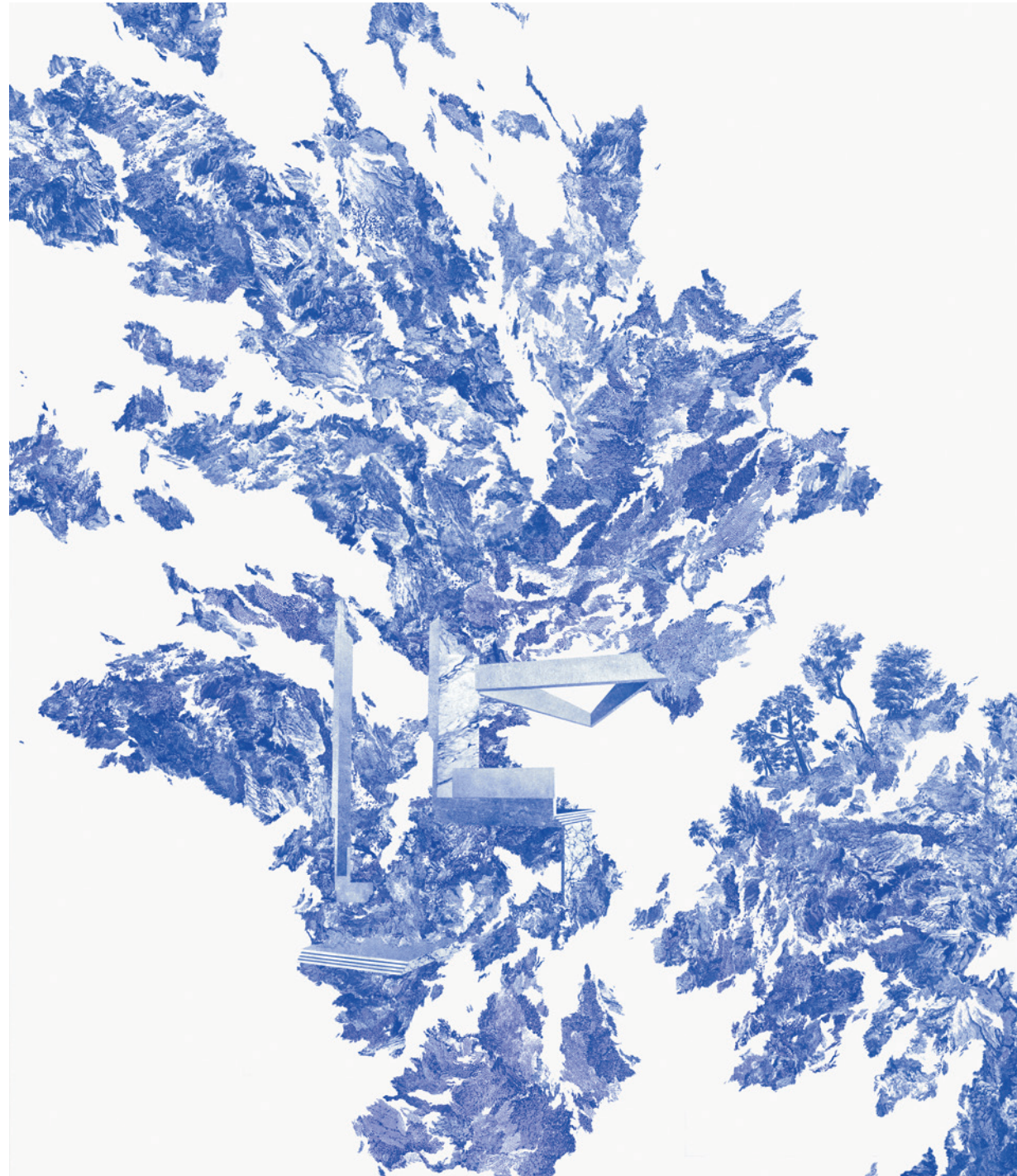
investors on their investment arrangements, including investment selection, setting investment strategy and due diligence with a focus on Hedge Funds and Alternatives. Asim holds a BSc in Mathematics and is a CFA Charterholder.



NASSIM OLIVE, Founding Partner - Chief Economist & COO of Eterna Capital. Nassim was previously a member of BlackRock's Institutional Client Business, responsible for covering Global and UK based insurance companies. As part of his role, he was in charge of developing business relationships and providing

solutions to clients. Nassim is passionate about markets, economics and politics. He joined BlackRock after completing his MSc in Finance with Distinction at Imperial College London in 2014. Nassim is a CFA Charterholder.

THE ROAD FROM THE STATUE OF LIBERTY TO TOKENISATION



Claire Trotignon - Conform Step, Canonic Void - 2016 - Oeuvres sur papier - 126 x 170 cm - Courtesy Collection Société Générale

“SWITZERLAND, HAS POSITIONED ITSELF AS A VANGUARD OF THIS NEW TECH, AS A MAJOR PLAYER WITH ITS LEGAL FRAMEWORK AND FINMA’S POSITION ON THE ISSUANCE OF DIGITAL TOKENS”

Crowdfunding, also known as “community and participating funding”, was born in the 1700s. But it wasn’t until 1875 that it bore fruit for a landmark project that is world famous to this day. It was thanks to fundraising/crowdfunding, mainly carried by the French citizenry, that the project known as the Statue of Liberty¹ was able to see the light of day.

Fast-forward to over a century later and the emergence of the internet for the latest iteration of Crowdfunding, mainly for creative start-ups and charitable projects.

In the era of digitisation and the emergence of blockchain technology, the tokenisation of assets has gained substantially more steam. Tokenisation refers to the process of incorporating rights related to an underlying asset into a digital token on the blockchain ledger. It is therefore quite easy to register a title deed on the ledger, thus ensuring its traceability, immutable form and ability to be audited.

In the case of an investment vehicle aimed at raising funds, the use of blockchain and the issuance of digital investment tokens offers additional advantages such as lower costs (compared to an IPO), an automated process (via the use of smart contracts) or traceability. Investors also benefit from the new business model: disintermediation, transparency, lower entry costs and access to a local, national or international investment portfolio.

For many of us, a real estate investment remains safe, sustainable and tangible. However, with a direct investment requiring a significant capital outlay and or investment via a real estate fund requiring some

knowledge of the financial markets, the path can prove perilous if it is not well guided. Moreover, in countries where an absence of reliable land registers limits investment, access to property encourages fraudulent practices.

Switzerland, has positioned itself as a vanguard of this new tech, as a major player with its legal framework and FINMA’s position on the issuance of digital tokens². Start-ups such as TokenEstate (real estate tokenisation), Tend (asset tokenisation) or Mt Pelerin (tokenisation of shares) are already lighting the way, and no doubt in the near future other platforms will also emerge.

It’s easy to imagine the advantages of tokenisation on the world of real estate. However, this would require that the land registry adopt and recognise blockchain registration as valid and legal within an enforced legal framework. Certain countries such as England, Switzerland, Sweden and Brazil³ are already studying the feasibility of such projects, and the use of blockchain may well replace the cadastre and other land registries.

(1) <https://www.bbc.com/news/magazine-21932675>. (2) Finma Pratical Guide, February 2018. (3) <http://bitcoinmonde.com>.



SEBASTIEN FLAK is director at Crypto Solutions SA, a company held by Geneva Management group and is based in Geneva. He assists individuals and institutions to structure investments in crypto-assets, cash-out profits realised through tokens and understanding how blockchain will impact the financial

business industry. He has a diploma from a High Business School in Paris in Economy and Finance.

WHAT IS THE APPEAL OF CRYPTO ASSETS FOR ASSET MANAGEMENT?



Joe Reihsen - Just This - 2016 - Peinture - 152,4 x 119,38 cm - Courtesy Collection Société Générale

Let's first clarify that, when talking about Crypto Assets, we will not consider so-called currency tokens or utility tokens but rather focus on "investment" or "security tokens", i.e. instruments that should be understood as being comparable and subject to the same regulatory framework as securities (loans/debt, equity, funds, etc.) in the traditional world, and we will look at the appeal of issuing such instruments on a blockchain infrastructure for asset managers.

Issuing securities on a blockchain infrastructure can bring a number of benefits to asset managers and their investors. This could potentially be true for issuers of any type of financial instruments, but more specifically for those involved in the issuance and management of private equity funds, venture capital funds or real estate funds for instance, i.e. instruments that are currently generally not issued on large existing market infrastructures like CSDs or ICSDs, which generally require some flexibility in terms of the technical features they offer, which generally still suffer from many manual interventions in their handling process and which, most of the time, are not or are barely transferable between investors after their initial issuance (no transferability, and hence no liquidity post-issuance).

The key benefits blockchain could then bring through tokenised securities would mainly be the following:

Global Reach: blockchain is a global infrastructure, technically reachable from anywhere in the world, which means that by issuing securities on the blockchain, issuers can potentially make them available to any investor, and these could have their positions registered on one single, global, market infrastructure. This is very different from the traditional way of holding cross-border securities, which would typically involve a chain of local and global custodians in addition to issuer and investor CSDs (or investment funds, a main register and one or more local registers). Of course, this "technical" global reach, which brings a number of operational and cost benefits, does not mean "regulatory" global reach, and the issuer still needs to make sure the instrument he or she issues complies with the regulations of the country of issuance and the countries targeted for distribution;

Resilience: by definition of its distributed ledger nature, the blockchain is more resilient than most existing market infrastructures, most of them constituting single points of failure, and it is achieving this at a much lower cost in comparison. The blockchain is also operating on a 24/7 basis, which is not the case of traditional markets;

Speed: by its nature, blockchain allows the time between trading and settlement to be dramatically reduced, if not eliminated, as the trade is the settlement instruction, it also reduces the risks of mishandling and errors in transactions;

Transparency: as, on a blockchain infrastructure, all positions can be held on one single global ledger, it

potentially allows for full transparency for the Issuer, its agent(s), the regulators, etc. For some types of instruments characterised today by multiple layers of custody/distribution, it will clearly allow Issuers/Asset managers to reconnect with their investors;

Operational Efficiency: as all positions are held on one single global ledger, Blockchain very much reduces or even virtually eliminates the need for successive layers of reconciliations (as well as investigations and possibly remediation of breaches) frequently seen in traditional custody chains. This direct access of issuers to their investors also offers positive prospects in terms of making voting and proxy voting processes more efficient.

Many of those benefits are obviously directly derived from the global nature of the blockchain and linked to the fact that positions can be maintained on such infrastructure at a (as much as possible) granular level. The technology offers the possibility of operating in such a way, but all stakeholders will need to "play the game" and leverage on such capability rather than replicating the traditional custody (or distribution) chain using multiple layers of omnibus accounts.

Obviously, in order to reap all the benefits that blockchain technology can offer, regulations, which are in general still very "local", will have to evolve in order to cater for a global infrastructure that could not even be imagined when most of them were set up. Things have started to move in a number of countries in that respect, but most projects have been fostered at local level whereas supranational initiatives remain marginal.

In both cases (industry stakeholders adoption and regulation) asset managers – securities issuers in general – have a role to play, first by educating themselves and their counterparts as to what the blockchain is and what it could bring to them and their investors, and then advocating for its adoption with their regulatory and business counterparts.



LUC FALEMPIN

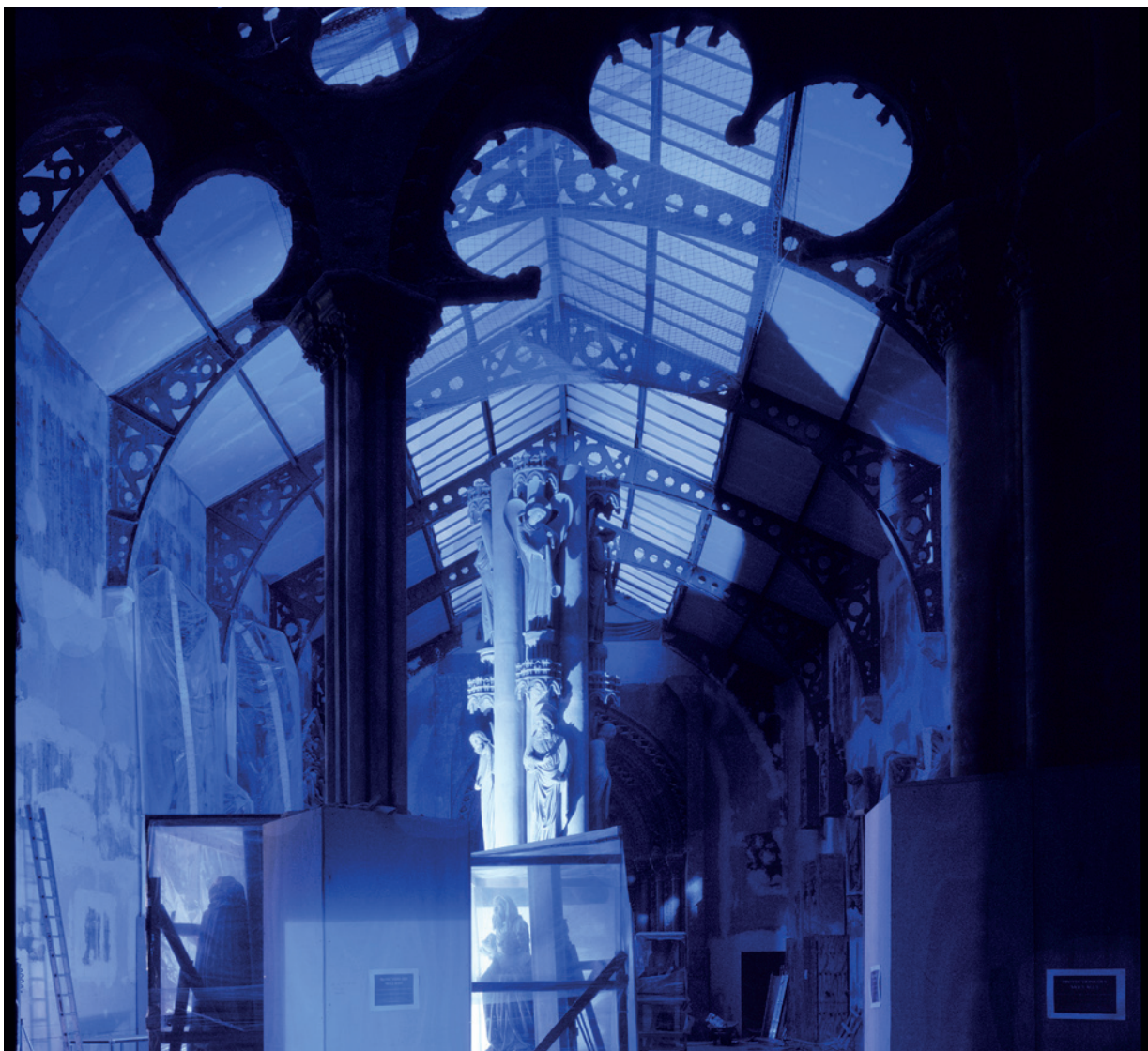
In 2012, Luc founded his first venture in Modizy, an AI and technology-driven social shopping platform, which he sold later in 2015 to pivot to another technology platform in Izberg, a SaaS solution widely recognised as one of the most advanced e-commerce platforms for online

marketplaces. In 2017, Luc sold his stake in Izberg to focus on Tokeny, a technology solution with the vision of disrupting traditional finance. Luc graduated with a BA (Hons) from University of Montreal, achieved an Ebusiness MBA at Institut Léonard de Vinci (Paris) and received a web analytics diploma from University of San Francisco.

MOVING BEYOND TANGIBLE THINKING IN TOKENS

Tokenisation is transformative. It's already proved its mettle in financial services: from payment authentication tokens, to security tokens that sit on mobile devices for an on-the-glass financial services experience, to facilitating direct bank-to-bank transactions. They've even transformed the world of trade finance, enabling us to relay real-time information on supply chain activities so we can better price risk at each step of the journey as goods change hands, and make their way around the globe.

These operational efficiencies that tokenisation brings have done wonders for back office simplification, for better real-time risk pricing, for cyber security, and have smoothed out the customer experience. Yet we still have to fully explore how they can fundamentally change business models for asset management; and they will, oh, they will.



Anne Garde - Musée des Monuments Français - 2006 - Photographie - 100 x 120 cm - Courtesy Collection Société Générale

REPRESENTATION OF THE TANGIBLE AND THE INTANGIBLE

Tokens allow us to redefine what can be securitised. They allow us to trade beyond goods, beyond the perceived value of companies, solutions, and their market value. Tokens allow us to move value creation into the esoteric realm, where ideas, concepts, and thoughts can be traded – where these seemingly existential things are translated into real monetary value without needing to be tangible. Asset value, and therefore wealth, is no longer tied to temporal things: we now have a placeholder, a token, that represents

**“WHAT CAN BE CONCEIVED
CAN BE TOKENISED,
AND WHAT CAN BE
TOKENISED CAN BE
SECURITISED. WHAT CAN
BE SECURITISED CAN BE
TRADED.”**

the snap and sizzle of synaptic motion and intellectual vigor. Intellectual property can now be traded before it bears physical proof or manifests itself in a recognised physical form.

Data can move beyond being fuel for business decisions or market positioning to being a market in and of itself. Intelligence, insight, ideas – all of these things in token form can now be considered an asset with an inherent market value that can stand alone. And these ideas can be managed, and will have a market, just like any traditional asset.

BEYOND IDENTITY MANAGEMENT

Consider identity, and the privacy around an individual's or corporate's or asset's identity. Identity is fundamental to being part of the financial system. It is dynamic and contextual, and now – under GDPR – is so considered to be some of the most critical and crucial data that it has its own special regulatory protection. Divulging personal identifiable information without permission comes at an onerously costly price. Yet identity isn't a tangible thing – it is a concept, a principle, an idea. The privacy that surrounds identity is even more valuable, and yet it is just as esoteric as identity. These concepts have value, monetary value at that, and both of these concepts already exist as tokens.

And markets exist in which these concepts are traded: for access and permission to other goods and services. Currently, we do not manage these assets in a way that reflects their market value; yet we could and should.

Video gaming, may not seem relevant to asset management – unless it's a video gaming company's stock listing. But it gives us a model to consider as a template for creating new assets. Identity in video games is linked to powers, abilities, additional weapons, and power structures inside the game. These games are not siloed to individual players, but are expansive networks

of thousands or millions of players linked together around the world. Identities, and their characteristics that have value, are often traded across these networks for other powers, tools, permissions, and team access. Identity in gaming is a market unto itself, one that is conceptual not temporal. And these identity assets are managed, traded, and speculated upon just like any other traditional financial asset in the gaming market.

TOKENS GIVE VALUE TO DATA AND CONCEPTS

Tokens permit these conceptual markets to exist in the larger financial world. They let those markets generate, trade, and leverage value. Tokens enable a myriad of data-centric or data-based concepts to be securitised. Tokens allow us to move beyond a 3-dimensional tangible marketplace, letting us package, price, and exchange in new dimensions.

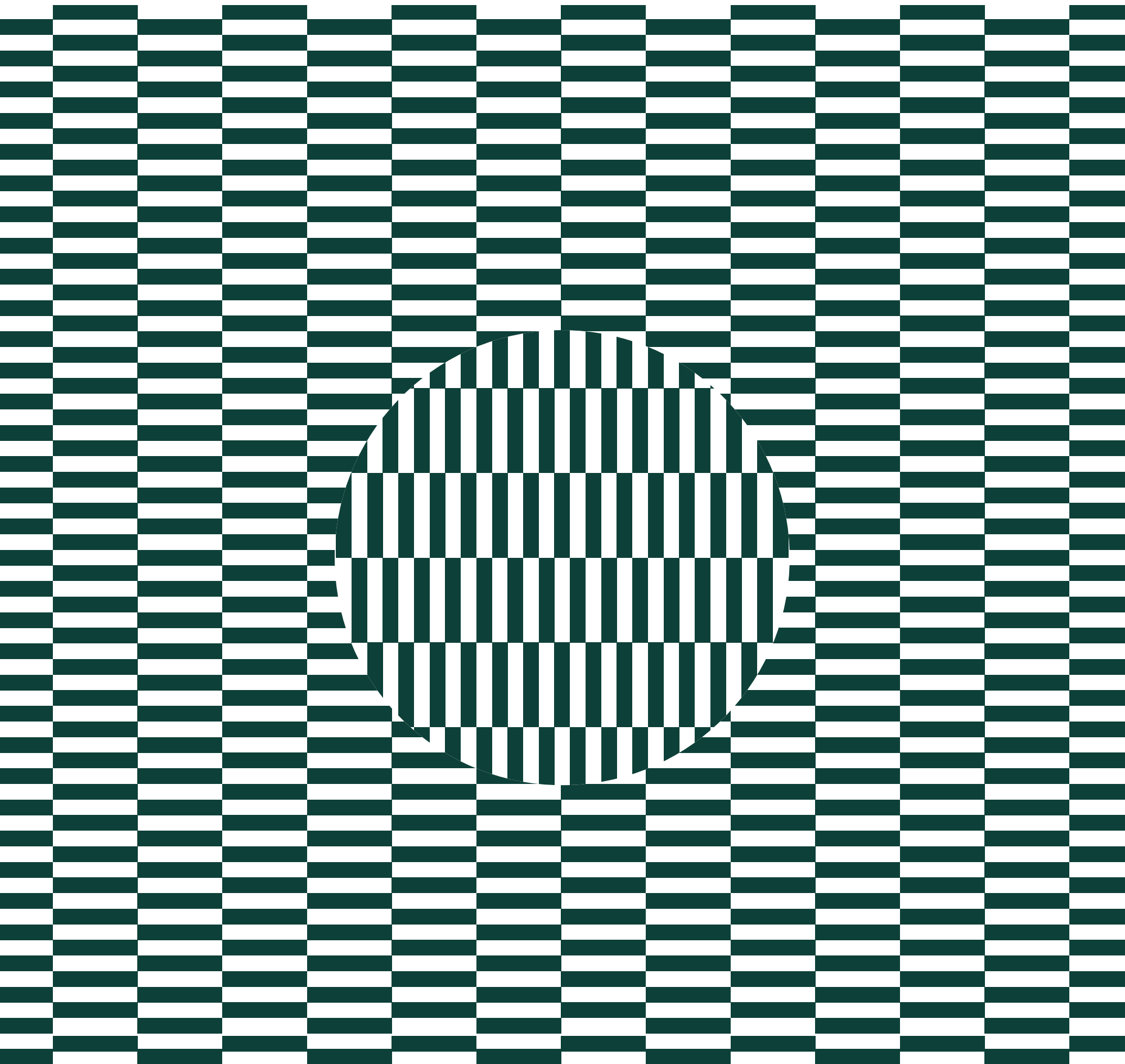
For asset management, this means an opportunity to build new secondary asset classes of things we can only imagine (literally). Tokens facilitate a hyper fragmentation of markets, where even a market of two actors can securitise an idea and trade on its value. Even the distribution patterns on those traded tokenised ideas have value, and the insights on how a concept goes viral – and which markets it goes viral in – have value that can be securitised. How ideas travel, where they become embedded, who buys (literally) into the idea: all of these insights can be tokenised as well. Insight markets will become an asset class. This new business model replicates itself easily, and begs for a proliferation of secondary asset classes to satisfy the demand for data. Data is an asset, and tokens allow it to move across markets.

The vision of the future of asset management will be just that: made of visions, dreams, ideas, and thoughts. **What can be conceived can be tokenised, and what can be tokenised can be securitised. What can be securitised can be traded.** It all has a value in a market, and that market can be managed. The future of asset management is the stuff of which dreams are made. Literally.



GHELA BOSKOVICH

Founder / Head of Fintech
& Regtech Partnerships
FemTechGlobal / Rainmaking
& Startupbootcamp.



WHAT'S TOMORROW'S FRAMEWORK?



THE “PACTE” BILL AND NEW FRENCH REGULATORY REGIME FOR CRYPTO-ASSET SERVICE PROVIDERS



Julien Des Monstiers - Brand New Old - 2016 - Peinture - 166 x 150 cm - Courtesy Collection Société Générale

The French Parliament is about to enact the PACTE bill that will set a new regulatory regime applicable to Initial Coin Offerings (for utility tokens only) and to several categories of “crypto-asset service providers”, where crypto-assets do not qualify as financial instruments pursuant to MiFID II.

This regime is being adopted at a turning point in the history of the European regulation of the crypto-asset market: a few months after the publication of the ESMA and the EBA’s advice to the European Commission¹, and at a time when Vice-President Dombrovskis has confirmed the need to rethink the EU regulatory response given to financial innovation and, more specifically, to crypto-assets².

AN INNOVATIVE APPROACH

Under French law, crypto-asset service providers established in France will have the possibility of opting in to an “optional regime”. If they decide to opt in, they will have to comply with all the requirements applicable under the optional regime and will be put under the authority of the AMF as “licensed crypto-asset service providers”. However, if they decide not to opt in to the optional regime, crypto-asset service providers established in France will be able to run their activities without being suspected of unlawful conduct in France. In other words, as soon as a crypto-asset service provider established in France decides to opt in, all the applicable requirements pursuant to the optional regime stop being optional.

The related crypto-asset services³ that will be covered by the optional regime include (i) the provision of a custodian wallet; (ii) the provision of a crypto/fiat currency exchange; (iii) the provision of a crypto/crypto exchange; (iv) the management of a crypto trading platform; (v) execution of orders on crypto-assets on behalf of clients; (vi) crypto-asset portfolio management, (vii) investment advice on crypto-assets; (viii) underwriting of crypto-assets on a firm commitment basis; (ix) placing of crypto-assets on a firm commitment basis; and (x) placing of crypto-assets without a firm commitment basis. To seek a license from the AMF, crypto-asset service providers established in France will have to permanently fulfil diverse requirements concerning, for example, the risks of fraud, safety risks as well as operational risks; internal control mechanisms; resilience of IT systems; and potential conflicts of interest.

The draft PACTE bill defines additional requirements to be fulfilled on an ongoing basis by licensed crypto-asset service providers, such as the obligation to communicate to their clients in a clear and accurate manner and not provide misleading information (including in the context of marketing communication); the obligation to disclose their fee policy; the obligation to put in place an effective policy for handling complaints; etc. The draft PACTE bill also lays down specific requirements for each of the services listed above. The details of the applicable requirements will be listed in the decree.

SOME SPECIFICITIES RESULTING FROM HIGHER AML/CFT REQUIREMENTS

One specific exception to the optional nature of the regime relates to AML/CFT⁴ requirements. Pursuant to the current version of the draft PACTE bill, certain crypto-asset service providers (when providing the services from i. to ii.) will have to mandatory “register” with the AMF and comply with AML/CFT requirements laid down in French law. This registration⁵ requirement is mandatory. On this basis, the AMF will regularly publish a list of “registered crypto-asset service providers”. The provision of services from (i) to (ii) will be prohibited if the providers of those services are not registered with the AMF. This new regime will place France at the forefront of regulatory innovation, not only in Europe but also on a global level. Various initiatives have recently been conducted around the world to cope with financial innovation, mainly in Asia (in particular in Singapore and in Hong Kong, where tailored rules have been developed). Across the Atlantic, some recent statements from SEC Chairman⁶ Jay Clayton also tend to prove that there is a growing consensus among the regulatory community regarding the need to innovate by and with the rules. France has fired the first shot with the aim of attracting businesses willing to scale up in Europe thanks to a credible regulatory label. It is now up to EU institutions to leverage on national examples to build-up a consistent EU-wide regime.

(1) ESMA (European Securities Markets Authority), “Advice on Initial Coin Offerings and Crypto-Assets”, 9 January 2019. EBA (European Banking Authority), “Report with advice for the European Commission”, 9 January 2019. (2) VP Dombrovskis speech opening the 3rd annual Afore Fintech Conference, February 2019. (3) A decree will detail the definition of each of these services. This decree is likely to be published by spring 2019. (4) anti money laundering-combatting the financing of terrorism. (5) In this context, registration means “declaration” and is different from licensing (which refers to the license that will be given by the AMF to the providers that will opt in). Registration will essentially require a fit and proper test for the management staff of the registered entities. (6) <https://coincenter.org/files/2019-03/clayton-token-response.pdf>

THE BENEFITS OF AN EXISTING LEGAL FRAMEWORK

The new framework dedicated to “crypto” players in the PACTE law is a real breakthrough, firstly from a legislative standpoint and secondly in the way in which a new economic and technological environment is considered. By drawing on existing rules that have been shown to work in particular in other fields of finance, and by adapting them to a new paradigm, all the while innovating with an optional regime, France is showing its ability to step up to the challenge in relation to other, more conservative, jurisdictions.

The “crypto” environment does indeed need innovative regulators capable of understanding the specifics and operation of new business models and providing “crypto” players with the legal protection they need to further develop their activities.

Pulling on the rule until it can no longer demonstrate its efficiency is therefore not the solution. Ignoring regulatory practices that have shown their efficiency would also be

a mistake. It is therefore not always necessary to provide for everything under the sun in financial regulation, but rather to adapt it to a decentralised environment that relies on new information technology protocols and that must now be taken into consideration when drafting legal concepts and definitions. To say that “code is law” would be inappropriate. Quite the contrary. The law must understand the code and integrate it within its logic and wording. It is now a question of working on the way the law, in particular European law, is written so that it can follow blockchain-related technological changes quickly enough without being an obstacle to the development of EU players. Europe’s ambition and responsiveness, its grasp of “on-chain” business models, its experience of previous rules and their subsequent adjustments provide the necessary foundation for the success of the law applied to blockchain, and more specifically of the law applied to the “crypto” industry, currently looking for legal certainty.



FRANCK GUIADER, Head of Innovation and FinTech at Gide Loyrette Nouel. Frank is an innovation regulation expert (blockchain, IA, robot) Within Gide, he created a team dedicated to legal and regulation prospective, decision making and legal structuring in the digital innovation sector (Gide 255). Before joining Gide, Franck worked for the French financial market regulator (AMF) where he successively was Head of

Asset Management Regulation and Head of Fintech, Innovation and Competitiveness. Prior to his functions at the AMF, Franck worked for 10 years for leading financial institutions (Lazard, NYSE Euronext, BNPP).



JENNIFER D'HOIR, Innovation and Fintech Specialist at Gide Loyrette Nouel. Jennifer is specialised in influence strategy, lobbying and international negotiations. Before joining Gide 255, she worked for 5 years within the Regulation and

International Affairs division of AMF. From 2015 to 2018, she was Head of international affairs in charge of coordinating AMF's actions and lead cooperation actions with international regulation authorities.



Sonja Braas - The Quiet of Dissolution, Ice Storm - 2005 - Photographie - 159,1 x 206,5 cm - Courtesy Collection Société Générale

SHOULD BLOCKCHAIN BE ARMED WITH ITS OWN REGULATIONS?

Blockchain appeared in 2008 with the peer-to-peer electronic cash system developed by Satoshi Nakamoto (called Bitcoin), and it is on the verge of revolutionising how we interact and conclude transactions in the digital world. It has far-reaching applications, from the financial industry to many other sectors of the economy, such as transport, healthcare, real estate, etc. Now that we have a better understanding of the technological, economic and strategic implications of what blockchain is, it is of upmost importance to address the question of whether blockchain and Distributed Ledger Technologies (“DLT”s) need, beyond any specific trade sector, a dedicated and harmonised legal framework at both EU and international levels.



Franck Chalendar - Ichrome n°21 - 1996 - Peinture - 205 x 205 cm - Courtesy Collection Société Générale

THE CURRENT REGULATORY LANDSCAPE

Since 2016, many regulators have become more proactive in helping existing blockchain projects find a place to call home (Securities and Exchange Commission, Financial Conduct Authority...). Countries such as the USA, Singapore, Canada, Australia and Dubai have paved the way for the rise of their own nascent blockchain industries.

In Europe, several jurisdictions are adjusting their local business and tax laws to create new crypto and DLT-friendly ecosystems. Even countries traditionally known as being strong guarantors of investors' protection such as France have recently adapted their legal and taxation regimes.

“INDEED, IF BLOCKCHAIN AND DLTS REACH THEIR FULL POTENTIAL, THEY WILL HAVE A MAJOR IMPACT ON HOW COMPANIES DO BUSINESS AND INTERACT WITH EACH OTHER AND WITH THEIR CUSTOMERS”

In that respect, the new French regulatory landscape is probably one of the most attractive with (a) the Ordinance of the 8 December 2017 dedicated to Security Tokens Offerings (“STO”), (b) the Pacte law, which (i) enshrines the possibility for France-based issuers to launch an Initial Utility Tokens Offerings stamped by the AMF (Autorité des Marchés Financiers, the French stock market authority)

and (ii) provides for an optional regulation of crypto assets providers, and (c) the 2019 budgetary and taxation law which clarifies the manner in which crypto assets are taxed.

That being said, as non-permissioned blockchains such as Ethereum or Eos are developing and the blockchain industry matures further with the apparition of new protocols and APIs ensuring the interoperability of DLTS, some players consider that new legislation would be needed to cover crucial areas linked to cybersecurity and sovereignty stakes, financial stability and systemic risk exposure.

Indeed, some voices raise concern over the need for standardisation and normalisation to ensure a sound development of DLTS and crypto assets. They thus express a need for a regulatory harmonisation and convergence at both EU and international levels.

LEGAL AND GOVERNANCE CHALLENGES OF USING BLOCKCHAIN TECHNOLOGY AND DLTS ON A CROSS-BORDER BASIS

The proponents of harmonisation point out that, as crypto assets are being transferred across jurisdictions while no specific standardised protocol for such distributed

databases exists, there is a clear need for standardised requirements at global level for messaging, cybersecurity, data protection and continuity of activities (in the context of a major incident). Such requirements may be specified whatever the trade sector.

Interoperability is probably the most important topic to consider, as it focuses on ensuring secured links between blockchains so that (i) all players may develop their own system for the market to select which one to use whilst (ii) ensuring that users may enjoy the benefit of common features to facilitate their handling of such crypto assets.

Finally, a last key concern to address is the question of liability when delegating some essential or critical tasks related to the use or the operating of a blockchain. This is especially important with respect to non-permissioned blockchains that are theoretically fully decentralised i.e. without identified miners¹ bearing some kind of liability beyond their role of checking and validating the transactions.

Given all these critical aspects, and considering the cross-cutting nature of blockchain, such a technology can no longer be seen as a neutral one only requiring minimum adaptations of each sectoral regulation. Indeed, if blockchain and DLTS reach their full potential, they will have a major impact on how companies do business and interact with each other and with their customers.

Public authorities and policymakers will have to consider legislative actions not only to prevent market players from evading or circumventing laws, but rather to create a well-structured regulatory framework, adapted to the stakes of blockchains and crypto assets' development.

Within this context, the European Union must assume leadership in identifying specific features to regulate blockchains on a cross-sectoral basis. As a good first step, the European Commission published a fintech action plan in March 2018 highlighting its appetite to propose concrete measures for the next 2019-2024 legislature. The question is therefore whether these regulations will incentivise good conduct or, on the contrary, prescribe and prohibit. Most players hope that they will belong to the first category.

⁽¹⁾ Miners are the parties validating the transactions and building the consensus to make the blockchain unalterable.



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SECURING CRYPTO-ASSETS: THE LEDGER EXAMPLE

Blockchains are distributed databases that keep up-to-date records linking digital assets to their owners. Cryptographic secrets called “private keys” enable individuals to control such digital assets stored on the blockchain. Private keys comprise random data (see example below), giving control (and therefore practical ownership) over digital assets to individuals or organisations.

THE PRIVATE KEYS AT THE CORE OF THE SECURITY SET

Private keys contain highly sensitive information, which should remain private (as their name implies) because they give full control over the crypto-assets contained in a given crypto-currency wallet (e.g. Ether, Bitcoin or other crypto-assets) and are the only way to access the crypto-assets and cannot be recovered in case of loss. In addition, if private keys are stolen (i.e. if a private key is uncovered

by a third party), the thief will be able to take control of the crypto-assets related to such private keys.

De facto, it is absolutely critical for crypto assets’ owners to avoid having their private keys lost or stolen, as they are the only way to access digital assets recorded on a blockchain.



Sépand Danesh - Soulèvement - 2015 - Peinture - 140 x 200 cm - Courtesy Collection Société Générale

Traditionally, one tends to consider that there are currently two types of solutions to store private keys:

1. hot storage (or hot wallet): the private key is stored online, usually on a website offering wallet services (such as crypto-exchanges) or on the owner’s computer or cell phone (using wallet software)
2. cold storage (or cold wallet): the private key is stored offline, usually on a piece of paper (called a “paper wallet”).

Although the first category (hot storage) is considered more user-friendly (and is generally used by the average public), it is not recommended to store significant amounts of crypto-assets in hot storage. Indeed, hot wallets put crypto-assets at risk because private keys are hosted on a device connected to the Internet that can be targeted by hackers to uncover these keys. While cold storage in a paper wallet is much more secure than hot storage solutions, it is also very inconvenient and prone to operational mistakes, which can lead to the loss of crypto-assets¹. Indeed, if done properly, the process of creating a paper wallet is more complicated than simply copying the private key onto a piece of paper, as it involves a risky operation to ensure that no digital trace of the private key is left on a computer or other electronic devices. This process is impractical and certainly not suitable for the average individual, companies or other organisations. To address this issue while keeping private keys offline, a few companies, such as Ledger, have introduced the concept of hardware wallets.

WHY HARDWARE WALLETS ARE THE SOLUTION

Hardware wallets are devices dedicated to the storage of private keys, allowing their users to keep their private keys safe with what would most resemble cold storage in a much less risky and more convenient manner than setting up a paper wallet. As with pure cold storage solutions, private keys are never exposed to the Internet even when the hardware wallet is connected. As mentioned above, a few companies are currently producing and selling hardware wallets, but what makes Ledger’s devices (the Nano S and the Nano X) technically more secure than those of its competitors is that they are built around a secure element: an isolated chip designed to resist even the most sophisticated software and hardware attacks. The private keys protected by the secure element are therefore never exposed to such attacks, even when the device is connected to a computer or other device connected to the Internet (for example when the user checks their portfolio balance or makes a transfer). To allow a secure element (like the chip used in credit cards) to sign crypto-assets transactions with private keys stored in its hardware wallets, Ledger has developed its own unique operating system (BOLOS), which is designed for maximum security. This operating system is the only OS fully compatible with blockchain applications designed with security as a top priority. Indeed, we believe that it would be extremely difficult to reproduce this OS, as it would require a long process and rare expertise in the field of secure elements (which is the Ledger’s founders’ area of expertise). Ledger is continuously improving the security of its devices by relentlessly simulating attacks against them from each and every angle and by listening to feedback from a large community of cryptographers and

other security experts with whom Ledger has been in touch over the years. To this end, Ledger has developed in-house attack and security expertise with a dedicated laboratory.

FROM RETAIL TO ENTERPRISE

To take such a security level from retail to enterprise, Ledger has built the Ledger Vault solution. The Ledger Vault is a made-to-measure enterprise-level solution that helps companies, institutional investors and other financial institutions gain full control of and safeguard their crypto-assets. It is based on an end-to-end secure channel between (i) a server-based Hardware Security Module (HSM) orchestrating the governance and (ii) operators’ Ledger Blue devices (equivalent to the Ledger Nano S) to enable customers to maintain control of their private keys through the use of secure hardware, offering multi-signature authorisation on multiple accounts for a broad range of crypto-assets. This solution, which provides the same level of security as its hardware devices, was designed for hedge funds, family offices, HNWI² and banks looking to secure their crypto-assets and comply with the financial industry’s highest security standards and best practices. Indeed, when dealing with crypto-assets, organisations are in dire need of a secure multi-signature private key management system enabling them to program a set of authorisations and sub-authorisations that can be tailored to fit their structure. Ledger Vault’s features, such as the time lock, which allows transactions to be put on hold for a predetermined period of time, or the whitelisting, which allows outbound transactions to be limited, serve the need of institutions when dealing with crypto-assets, specifically on behalf of third parties.

Last but not least, Ledger Vault’s technology offers a multi-signature system that is not dependent on one blockchain/ crypto-asset (unlike the Ethereum blockchain smart contracts). This multi-signature system (which requires more than one person to initiate a transaction) is particularly suited to large companies having substantial crypto-assets under management. The Vault is also appropriate to safeguard crypto-assets raised during an ICO or an STO. It gives those who decide to use the Ledger Vault solution the ability to exercise better governance to control the funds in their custody on behalf of their clients.

(1) Only expert users can properly set up paper wallets, as the process is complicated and painstaking. Many (including experts) have lost significant amounts of crypto-assets by making mistakes going through this process.
(2) High-net-worth individual.



ERIC LARCHEVÊQUE

Serial entrepreneur since 1996, Eric has founded several companies in various sectors across Europe. In 2013, he discovered Bitcoin and the blockchain technology that struck him as the fourth industrial revolution. He then opened La Maison du Bitcoin (recently rebranded Coinhouse) before co-founding Ledger with the ambition of building the next technological giant and becoming the benchmark in securing blockchain applications.

SWITCHING BACK TO FIAT MONEY

To be a real success, the Blockchain innovation that brought tokens and crypto-assets into being will need to be integrated within existing financial worlds. Pure players or crypto start-ups need to fulfil the regulation's requirements to integrate their digital assets in the economy, and financial institutions will be able to interact with these new assets only when the regulation becomes clear. The latest bills adopted in France and Luxembourg are, for instance, the first pillars of this evolution¹.



Romain Bernini - Bientôt un pouvoir - Peinture - 146 x 114 cm - Courtesy Collection Société Générale

Today, more and more banks are interested in acquiring customers who come from this new ecosystem. Companies that have carried out a successful ICO – Initial Coin Offering – need to open an account in order to pay wages and suppliers, crypto millionaires who want to cash out to buy a home have to follow an onboarding process and follow banks' compliance policy.

The same rules as in the FIAT world apply to the crypto world: after the traditional KYC – Know Your Customer – process, the bank has to verify the origin of funds and undertake AML (Anti Money Laundering) and CTF (Counter Terrorist Financing) checks. These rules have been specified directly for crypto-currencies. The 5th Anti-Money Laundering Directive directly addresses the crypto-currency regulation with new AML and CTF obligations, also called KYT – Know Your Transaction.

“TODAY, THE FIRST BANKS ARE IMPLEMENTING THESE NEW PROCESSES. THEY HAVE TO UNDERSTAND ALL THE NEW TRANSACTION FLOWS TO DEFINE NEW PROCEDURES”

Transactions done in a Blockchain – for instance for Bitcoin – are public but pseudonymous, as no names are stored in the Blockchain and only addresses are seen. Some tools from companies like Scorechain and other competitors provide powerful analytics to track transactions and group addresses

– called clusters –, giving very useful data to analyse on-chain activity and verify the origin of funds as stated by the customer. However, things are not quite that “easy”, as there could be a lot of interactions with off-chain transactions.

Let's take the example of a person who wants to transfer €1 million, stating this money comes from the sale of 250 Bitcoins with an average value of €4,000 each. What would be the onboarding process that the compliance officer would need to run in order to accept this fund?

Bitcoins can come from several sources including legit activities such as trading, mining or earnings (payment for a legal service) and of course illegal or undeclared activities (such as from sales of forbidden goods on the dark net or from ransomware).

If the customer has traded coins on an exchange, for instance he invested €1,000 three years ago and sold the coins later with a gain of 10x, he has to show the bank transfer corresponding to the €1,000 investment from his bank account to the exchange and the transaction log of the trades he carried out via the exchange, this could be very complex if he has traded in different crypto-currencies or tokens in the meantime.

Depending on the tax rules that apply to the customer, he might also be required to prove that all the tax declarations have been made and paid.

If the coins have been moved from wallets to wallets, we should also verify that these wallets were owned by the customer and ask him to sign the private key of the wallets and prove ownership. Again, advanced Blockchain explorers can follow the entire transaction flow, detect wallets and

display interactions with other exchanges or services such as mixing.

In the case of Bitcoins coming from mining, it's quite easy to trace the origin of coins, as they appear as a reward in the block of transactions as pure newly-issued coins. This is valid for individual mining, but can be more difficult to verify if it comes from mining pools or mining services in which the user does not really get the new coins but a part of the mining reward that can come from a wallet owned by the service. In this case, additional checks need to be run to analyse the mining activities.

Another possible source of coins is the payment for goods or services, in which case we have to check the payment against the corresponding invoices or order forms, verify if any applicable VAT was computed and paid and if the value of the goods or the services is correct – based on historical exchange rates with FIAT currency. It could also be necessary to check that the service or the good has been effectively delivered.

But the mission of the compliance department actually consists in verifying the story told by a customer rather than trying to find the origin of funds without any information from its customers. The department has to verify off-chain documents and on-chain data and see how they match, then – depending on the risk level – decide if the customer's funds can be accepted.

Finally, compliance should not stop after the onboarding is done; ongoing monitoring of the wallets could be necessary, the customer could have shown some transactions during the onboarding process to validate some coins and switch funds during the cash-out operations if they are undertaken during a lengthy period. For instance, Scorechain proposes the creation of automated alerts that can be triggered if new transactions are detected or if there is a modification of the risk scoring of the wallets.

Today, the first banks are implementing these new processes. They have to understand all the new transaction flows to define new procedures that combine on-chain and off-chain activities and to integrate them within the existing infrastructure. The arrival of stable coins is also a new step that will facilitate the interaction of crypto-assets in traditional finance.

(1) European Blockchain Partnership (EBP) and European Blockchain Services Infrastructure (EBSI), April 2018.



PIERRE GÉRARD started his entrepreneurial career in 2000 and was one of the co-founder of Jamendo. He started to show interest in Bitcoin and Blockchain in 2014. He created one of the first mobile Bitcoin wallet for iOS (Yallet), and then co-founded Scorechain in 2015. Pierre holds a master's degree in computer science.

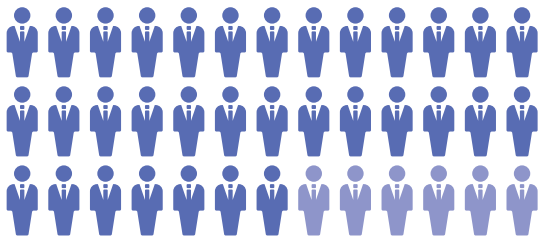
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4000
EMPLOYEES



SGSS internal report. Data as of 12.31.18

4011 BN EUR
ASSETS UNDER CUSTODY

609 BN EUR
ASSETS UNDER ADMINISTRATION

SG report as of December 31st 2018

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★ **Transfert Agent of the Year 2017**
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★ **European Transfert Agent of the Year 2017**
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★ **SGSS Russia delivers the best value for the customers according**
to Global Custodian 2017 survey

★ **Client clearing Broker of the year**
Global Investor Awards 2017

★ **Winner in France, Luxembourg, Romania, Russia, Morocco and Tunisia**
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