

GBBC
Global Blockchain
Business Council

BEYOND THE HYPE

Building Blockchains for the Real World

The GBBC 2019 Annual Report | January 2019

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GBBC

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Foreword

Tomicah Tillemann | Board Chair

The instinct to build is deeply ingrained in our species. It has driven humans to traverse oceans, populate continents and shape cities. But how does humankind move from instinct to reality? Before they changed the world, longboats and skyscrapers were only ideas. What enables our collective productive drive?

Tools, and the cooperation they enable, form civilizations. They are the ‘how to’ of progress — those intermediary steps between having an idea and making history; the mechanisms by which the intangible becomes, well, tangible. Blockchain technology — like a wheel or a chisel — is only a big idea because it is a step to even bigger ideas.

Society’s trust infrastructure is in desperate need of renovation. Confidence in institutions across every significant sector — government, media, business, and NGOs — has been in decline across the globe, and the consequences are grave. What tools can help us to repair the bedrock of trust upon which all civilizations rest?

Blockchain is a tremendous tool for the task; a tool for the type of building we need today. Transparent governance, secure exchange

of information — each of these are uniquely facilitated by this technology, and each is a critical update for contemporary societies. Blockchain tech gives innovators the equipment they need to create and recreate lasting architecture for modern civilization: enshrining facts, demanding accountability, and moving us past this current impasse of distrust and tribalism.

Blockchain’s potential is significant, but its realization is not guaranteed. The GBBC’s mission as a global convener and educator is vital. As actors across the world attempt to construct societies’ next great edifices, effective access to substantive information across countries and continents will be key to facilitating impactful and responsible innovation for all.

Think of this report as a construction update. The GBBC and its members are currently undertaking the hard, uniquely human work of building. This report is a peek at our progress to this point. We proudly share it with you today.

Best,
Tomicah Tillemann | Chair, GBBC



2018

Took GBBC

To
51
Events

Across
6
Continents

And
35
Cities

Asia

- Singapore
- Seoul, South Korea
- Hong Kong

Africa

- Atlas Mountains, Morocco
- Kigali, Rwanda

North America

- Washington, DC
- New York City, NY
- New Haven, CT
- Houston, TX
- Concord, NH
- Boston, MA
- Cambridge, MA
- Nashville, TN
- San Francisco, CA
- Omaha, NB
- Charlottesville, VA
- Castries, St. Lucia
- Philadelphia, PA

South America

- Brasilia, Brazil
- São Paulo, Brazil
- Buenos Aires, Argentina
- Cartagena, Colombia

Europe

- Paris, France
- Brussels, Belgium
- Vienna, Austria
- Davos, Switzerland
- Bellagio, Italy
- London, United Kingdom
- Copenhagen, Denmark
- Istanbul, Turkey
- Split, Croatia

Australia

- Perth
- Canberra
- Brisbane
- Sydney



Introduction

Sandra Ro | GBBC CEO

2018 was a year of crypto carnage to some, the anticipated trough of the Gartner Hype Cycle for others, and for the dedicated, another year of technical development and building.

When I look back on 2018, I vaguely recall the whirlwind of endless queues at airports of all shapes and sizes, the hundreds of thousands of miles traveled across 6 continents, and the constant nagging feeling there was so much more to do, sprinkled with occasional reminders by non-crypto friends that 'such and such crypto was at an all-time low of xx price, and did I still believe in all of this blockchain stuff?' No one ever said building emerging tech and adapting to fundamental paradigm shifts would be easy...

What really stayed with me in 2018?

The incredible, inspiring people we met from country leaders, policy makers, executives, humanitarians, technologists, celebrities, academics and entrepreneurs, trying to solve problems to build a better world: a 'human-centric world' using technology as a valuable tool and agent of positive change.

From the energy of motivated youth I met in Kigali, Rwanda during the Transform Africa Summit, the concentration of talent and technical know-how of entrepreneurs I met in Istanbul, Turkey during KOOP Fintech, the determination of a handful of bipartisan Congresspeople in South Korea to create the

Global Blockchain Policy Council (GBPC) to develop prudent digital asset legislation, and the no-nonsense practical applications of blockchain start-ups in Australia across livestock, commodities, metals & mining, and energy culminating the year at GBBC Blockchain Central Perth, just to highlight a few.

GBBC, will be approaching its two-year birthday at Davos 2019, and can look back on 2018 with much accomplished:

- 1)** increased membership five-fold to over 70 members across the globe, including leading Fortune 500 enterprises, midcaps, banks, governments, central banks, exchanges, custodians, asset managers, regulators, startups — big and small;
- 2)** traveled to over 20 countries to meet with governments to educate and discuss blockchain and crypto regulation from St Lucia to Australia to South Korea and USA.
- 3)** created operational arm of GBBC USA based in Washington DC and hired staff in London as well as increased headcount in Washington DC;
- 4)** merged Post Trade Distributed Ledger (PTDL) into GBBC umbrella organization, resulting in deep networks and membership across the incumbent financial services sector, particularly in Europe;

- 5) organized and cosponsored invitation only roundtable dinners across Brazil, UK, USA, and others;
- 6) supported the Rwandan government's AfricaGen Hackathon in Kigali, Rwanda for the first time to support over 100 youth developers to create blockchain solutions around a green economy;
- 7) partnered with Concordia to bring GBBC Blockchain Central to UN General Assembly Week in September
- 8) joined the founding group of the South Korea government led Global Blockchain Policy Council (GBPC) alongside government reps from Estonia, Finland, Japan, and Taiwan;
- 9) launched the NYC Blockchain Center in partnership with Future\Perfect Ventures (FPV) and NYC Economic Development Corporation (NYCEDC) via GBBC Labs, Inc (a newly formed subsidiary under GBBC Swiss parent entity);
- 10) opened GBBC office in NYC!

No matter how tough the path, let's be reminded by the inspiration of this technology that promotes creative thinking for new solutions, critical questioning of existing status quo, and most importantly, human collaboration which forms the very basis of purpose and

bonding of our collective experience.

2019 represents our opportunity to continue dreaming, building, and achieving. This is the year, and many more to come, which will delineate that, when humans care, when humans work together, we can overcome the worst hatred and fear. We need that now, more than ever.

Yes, technology can be used for good or bad. We, at GBBC, will continue to help world leaders, policymakers, influencers, and executives choose how technology will evolve and actively advocate a 'human-centric' approach for a better, fairer society.

I, for one, am more bullish than ever as we see some of the top minds across industries, and government take interest in blockchain and collaborate across geographies, from financial services to media and entertainment to public service delivery and supply chains.

Join us as we work together to build a bigger and better 2019.

Special thank you to all of our GBBC members, supporters, country ambassadors, and friends.

Sandra Ro | CEO, GBBC

PART ONE

Regulation | Key Trends

Prepared in collaboration with Steptoe & Johnson LLP,
Covington & Burling LLP, CLS Group

1) Regulation in the US: Where are We, and Where are We Going?



Alan Cohn and Jason Weinstein
Steptoe & Johnson LLP

The United States is a regulatory heavyweight. Companies and governments — including lawmakers and regulators — pay attention to what the U.S. does from a regulatory perspective. When U.S. regulators have spoken with respect to blockchain and cryptocurrency — in areas such as anti-money laundering, sanctions compliance, and counter-terrorism financing — companies and governments have listened. Yet recently, governments and companies outside of the U.S. have been stepping in and innovating from a regulatory perspective in areas such as securities and commodities regulation. In particular, governments in Switzerland, Singapore, the

United Kingdom, Hong Kong, the United Arab Emirates, Bermuda, Gibraltar, and others are beginning to develop compatible regulatory doctrine, especially in the area of financial instrument regulation and crypto-assets. With U.S. regulators finally asserting themselves in these areas in 2018, the potential for conflict arises as the nascent regulatory consensus developing outside of its borders offers some contrary policies. Thus, 2019 is a pivotal time for the U.S. to determine how it intends to engage with the international community while continuing to lead — or not — in areas it has long championed.

Anti-Money Laundering, Sanctions Compliance, and Counter-Terrorist Financing: Following the U.S. Lead

U.S. regulators were some of the first regulators to recognize the benefits of bringing cryptocurrency under existing regulatory frameworks. In 2013, the director of the Financial Crimes Enforcement Network (FinCEN), an agency of the U.S. Department of the Treasury, made the seminal decision that cryptocurrency could substitute for currency. This meant certain types of activities involving cryptocurrency were subject to heightened requirements under the Bank Secrecy Act (BSA), the U.S. law requiring financial institutions to

implement steps to combat money laundering. In 2014, FinCEN followed this announcement with guidance explaining how the BSA would apply to various entities in the cryptocurrency ecosystem, including software developers, miners, and cryptocurrency exchangers. FinCEN also brought a well-publicized action against an early, major cryptocurrency business, and built its own internal competency through the use of transaction analytics software and a growing collection of suspicious activity reports (SARs) filed by cryptocurrency exchanges, wallet

providers, and others. In 2018, FinCEN's director announced that the agency planned to conduct compliance audits for all FinCEN-registered cryptocurrency exchanges, and had completed two-thirds of those audits by mid-year. Likewise, the Treasury Department's Office of Foreign Asset Control (OFAC), which administers the U.S. economic sanctions program, designated the Venezuelan Petro as a prohibited virtual currency in March 2018. In November, FinCEN issued an order designating two Iranian nationals for blocking, which included bitcoin wallet addresses.

By contrast, it took several years for regulators in Europe and Asia to catch up. In South Korea, regulators raided exchanges to better understand their practices and in Europe,

regulators struggled to bring cryptocurrency and crypto-assets under the European Union's Anti-Money Laundering Directives. In 2019, FinCEN and other U.S. regulators are expected to continue leading in this space, with regulators across the world continuing to recognize the benefits of applying basic anti-money laundering, sanctions compliance, and counter-terrorist financing measures to cryptocurrency and crypto-asset businesses. This increased recognition and regulation will serve both to create a level baseline of compliance expectations and combating of criminality, and also to develop a better understanding of the businesses that populate the industry and construct a reporting relationship that helps effectively combat criminal use of cryptocurrency and crypto-assets.

Financial Instrument Regulation and Crypto-Assets: The US at a Crossroads

The primary U.S. federal regulators of financial instruments and trading markets — the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) — took different approaches from one another and from FinCEN. The CFTC began with an aggressive enforcement agenda, bringing actions and reaching settlements to establish its jurisdiction in 2015 and 2016, but transitioning to a more collaborative approach with industry in 2017 and 2018. The SEC took a wait-and-see approach, spending more than a year assessing the 2016 sale of Decentralized Autonomous Organization (DAO) tokens before issuing an analytic report in 2017 concluding that the DAO tokens constituted securities and warning that many crypto-tokens then being sold might constitute securities or “investment contracts” under U.S. law. SEC enforcement actions in 2017 shed light on fraudulent token sales and other unlawful practices, but it wasn't until 2018 that media reports of coordinated sweeps of the industry involving SEC field offices and state securities regulators slowed the sale of crypto-

tokens in the U.S. market. The SEC also stated that sales of Bitcoin and likely Ether would not be subject to U.S. securities laws, but the industry still awaits additional guidance on how to comply with certain U.S. securities laws.

All of this stands in stark contrast to efforts in jurisdictions such as Switzerland, Singapore, the United Kingdom, Hong Kong, the United Arab Emirates, Bermuda, Gibraltar, and others, which have focused on developing a new regulatory framework by trying to define classes of tokens: currency tokens such as cryptocurrency; asset tokens such as securities, debt instruments, and other types of financial instruments; and utility tokens such as those that provide access to and are used on blockchain-based platforms. This framework is still in its infancy, and guidance with respect to prudential supervision and oversight of utility tokens is still forthcoming, but a growing consensus is emerging that regulating all tokens as either a cryptocurrency or a regulated financial instrument (e.g., security or commodity) ignores the realities

and innovation brought forth by crypto-tokens.

All of this begs the question: what is the correct approach for establishing a prudential oversight regime for crypto-tokens that are meant to be used for access and consumptive use on a blockchain-based platform, as opposed to capital formation? In the U.S., the Congress and regulators are likely to consider whether such oversight could operate under the SEC or CFTC, under another agency like the Federal Trade Commission, or one or more self-

regulatory organizations created in coordination with regulators, companies, and industry associations. Outside of the U.S., in jurisdictions creating a new regulatory framework for utility tokens, regulators will need to build a prudential oversight regime for this new category of assets. In both cases, **regulators should be mindful of ways in which a new prudential oversight regime would promote or complicate compliance.** Hopefully 2019 will bring greater clarity on this issue, both in the U.S. and abroad.

Taxation: Hoping for Guidance in the New Year

The U.S. taxing authority, the Internal Revenue Service (IRS), was also an early entrant into the regulatory environment for cryptocurrency, providing guidance in 2014 that cryptocurrency would be taxed as property. However, the IRS then did little to provide additional guidance, and indeed was criticized by the Treasury Department's own inspector general for failing to either provide additional guidance or rigorously oversee either information reporting from businesses handling cryptocurrency transactions or the correct reporting or payment of income taxes by individuals and entities. This criticism spurred the IRS to bring an action against a major U.S. cryptocurrency exchange in an effort to obtain information about wallet holders — an effort that was narrowed in scope

after a court challenge but ultimately allowed to proceed — and to begin to give greater scrutiny to cryptocurrency transactions for potential tax violations. So far, though, the IRS has not provided additional guidance, and bills have been introduced in the Congress to provide relief, such as penalty relief for misreporting hard forks and exclusion from tax for de minimis transactions, although none have been passed into law. Formal guidance is unlikely in the near term, as the IRS has its hands full trying to implement the Tax Cuts and Jobs Act. However, the new IRS Commissioner has hinted that informal guidance (such as FAQs on the IRS website) might be forthcoming in 2019. It is also possible that the new Congress may finally take up legislation; only time will tell.

Blockchain Technology: The Year of the Regulator?

With all eyes on cryptocurrency and crypto-asset regulation, government regulators in other areas have quietly been experimenting with other uses of the technology and how existing regulatory regimes can help shape — or even incentivize — the adoption of blockchain technology. The most interesting area — although far from the only area — is trade finance and cross-border supply chains. 2018 saw the announcement in

the U.S. of a blockchain technology pilot by U.S. Customs and Border Protection focused on proof of provenance for NAFTA (North American Free Trade Agreement, soon to be US-Mexico-Canada Agreement (USMCA)) and CAFTA (Central American Free Trade Agreement) compliance. Around the world, the Hong Kong Monetary Authority and the Monetary Authority of Singapore announced the pilot use of blockchain

technology to track shipments along their trade corridor; the Port of Dubai continued work towards standardizing business operations using blockchain; and the World Customs Organization published a paper on blockchain use cases in for customs authorities. It would not be surprising to see similar developments in areas such as insurance, energy, pharmaceutical supply chain oversight, and other areas where regulators have both carrots and sticks available and where blockchain technology is making serious inroads and demonstrating value in a variety of use cases.

In sum, the regulatory situation in the U.S. is a patchwork, with the U.S. leading in some areas, trailing in others, and innovating alongside foreign counterparts to explore new uses for blockchain technology. 2019 has the potential to be the Year of the Regulator in the U.S., but it also has the potential to see the U.S. drift further away from its non-U.S. counterparts in critical areas for the industry.

2) Global Regulatory Landscape

Laws and regulation which touch applications of blockchain technology are anything but static. Read on for an update on recent shifts and changes to the global regulatory landscape.

UNITED STATES

Regulatory Update Authored by Steptoe & Johnson LLP

Regulation of Blockchain

- The United States does not currently have any law or regulation that comprehensively governs the use of blockchain and other DLTs. Industry-specific laws and regulations that govern products, services, and transactions, however, have application to blockchain technology, and guidance specific to blockchain technology is beginning to emerge. Companies considering the use of blockchain technology must consider any laws or regulations that govern the underlying product, service, or transaction.¹ In addition, legislation that enables or explores the use of blockchain technology in certain contexts, or regulates certain aspects thereof, has been

enacted in a growing number of states.²

- Federal and state agencies are actively exploring blockchain technology and its opportunities and risks, in areas such as supply chain management, digital identity and device authentication, customs compliance, and provenance of goods. These agencies are evaluating blockchain technology solutions with the goal of understanding how the technology works, whether the technology can streamline government and industry operations, and whether new regulations should be implemented or existing regulations should be modified.

Regulation of Cryptocurrencies

- No single U.S. regulatory agency regulates cryptocurrencies, and no comprehensive reg-

ulatory scheme exists in the U.S. regarding cryptocurrencies. However, federal regulations

- involving anti-money laundering and sanctions compliance, regulation of financial instruments and markets, and taxation, as well as state regulations in areas such as money transmission, impact cryptocurrencies to different degrees.
- Two agencies of the U.S. Department of the Treasury, the Financial Crimes Enforcement Network (FinCEN) and the Office of Foreign Asset Control (OFAC), both directly regulate certain aspects of handling cryptocurrency. FinCEN has issued guidance since 2014 describing how certain types of businesses handling cryptocurrency may be considered regulated financial institutions for the purposes of U.S. anti-money laundering requirements. Specifically, entities that administer or exchange cryptocurrencies, as FinCEN has defined those terms, are subject to anti-money laundering (AML) requirements under the U.S. Bank Secrecy Act, including a requirement to register with FinCEN.³ FinCEN enforcement actions as well as U.S. criminal proceedings have made clear that these requirements apply to not just to U.S. entities but also to foreign entities that do business or service customers in the United States.⁴ Companies conducting Initial Coin Offerings (ICOs) may also be required to register with FinCEN.⁵ Similarly, U.S. economic sanctions requirements apply to entities handling cryptocurrencies; OFAC has issued a blocking order prohibiting U.S. persons from engaging in transactions with the Venezuelan government's cryptocurrency, Petro,⁶ and included bitcoin wallet addresses in a blocking order relating to two Iranian individuals.⁷
- The U.S. Commodity Futures Trading Commission (CFTC) considers bitcoin and other virtual currencies to be commodities under the U.S. Commodities Exchange Act. Although the CFTC lacks jurisdiction under the Commodities Exchange Act over spot and cash transactions, the CFTC has brought enforcement proceedings against cryptocurrency exchanges for actions involving margin trading. The CFTC has also asserted its right to enforce anti-fraud and anti-manipulation authority over virtual currency transactions, and this assertion has been supported in at least one federal court decision.⁸ In addition, futures and options contracts and swap transactions are subject to comprehensive regulatory oversight by the CFTC.⁹
- The U.S. Securities and Exchange Commission (SEC) has begun issuing guidance pertaining to crypto-assets, particularly tokens that are the subject of Initial Coin Offerings (ICOs). The SEC has also brought enforcement actions involving cryptocurrency exchange platforms, and issued guidance pertaining to investment funds holding cryptocurrencies and crypto-tokens.¹⁰ The SEC has so far declined to approve cryptocurrency-based Exchange-Traded Funds (ETFs).¹¹
- Entities handling cryptocurrencies may also be required to obtain licenses from regulators in various states in which the entity conducts those activities. In many states, an entity may be required to apply for and obtain a money transmitter or equivalent license. New York is the only state to adopt comprehensive requirements for entities involved in cryptocurrency business operations, adopting its "BitLicense" regulations in 2015 and issuing under a dozen such BitLicenses (as well as acknowledging cryptocurrency business operations by a small number of additional entities holding other types of state charters).¹² By contrast, other states such as Wyoming have begun exempting certain types of cryptocurrency business activities from state laws and regulations.¹³
- Other U.S. federal regulatory agencies have increased their attention to cryptocurrency regulation. Since 2014, the IRS, for instance, has considered cryptocurrency property for tax purposes. U.S. persons are subject to tax on worldwide income from all sources, including transactions involving cryptocurrency, and the

IRS has launched a Virtual Currency Compliance campaign to address noncompliance.¹⁴The Office of the Comptroller of the Currency has made available a federal fintech charter,

but many states are challenging the availability of this charter on the grounds that it impermissibly intrudes on areas of responsibility retained by the states in the U.S. constitution.¹⁵

Initial Coin Offerings

- Following on from the SEC's report on the Decentralized Autonomous Organization token sale (DAO Report)¹⁶ and cease and desist proceedings involving the Munchie token,¹⁷ the SEC continued messaging its view that, in general, ICOs have involved offerings of securities. In February 2018, in testimony before the Senate Banking Committee, U.S. Securities and Exchange Commission (SEC) Chairman Jay Clayton affirmed his view that ICOs in general involve the offering of a security. In written testimony, he said "by and large, the structures of ICOs that I have seen involve the offer and sale of securities and directly implicate the securities registration requirements and other investor protection provisions of our federal securities laws."¹⁸
- In a well-publicized speech in June, the Director of the SEC's Division of Corporation Finance, William Hinman, addressed the potential for a digital asset to start out as a security (for example, in a pre-sale) and, over time, become something other than a security. Director Hinman suggested that a digital asset transaction may no longer represent a security offering if the network on which the token or coin is to function is sufficiently decentralized, such that purchasers would no longer reasonably expect a person or group to carry out essential managerial or entrepreneurial efforts. In such a case, he reasoned, the assets may not represent an investment contract. The speech identified a number of factors that parties could look to as part of a legal analysis of whether an asset meets the definition of an "investment contract" under the legal framework set forth in *SEC v. Howey*,¹⁹ the 1946 United States Supreme Court case defining investment contracts.²⁰
- The Hinman speech also is widely cited for the conclusion that Ether, the native token of Ethereum, is not a security. While the speech is not an official SEC position and is not binding on the Commission, it has been widely credited with adding regulatory clarity with respect to what was at the time the second largest digital asset in terms of market capitalization. In particular, Hinman said "based on my understanding of the present state of Ether, the Ethereum network and its decentralized structure, current offers and sales of Ether are not securities transactions."²¹
- In November, the SEC settled charges against two ICOs that it determined were securities. In settlements with AirFox and Paragon Coin, the SEC required the companies to pay monetary penalties, register the tokens as securities, and file periodic reports with the Commission.²²The SEC also required the companies to conduct a claims recovery process for investors who purchased the tokens in the illegal offerings. In a concurrent statement issued by the staff of the SEC Divisions of Corporation Finance, Investment Management, and Trading and Markets, these settled orders were identified as "a path to compliance with the federal securities laws going forward..."²³
- The SEC also brought attention to the risks of ICOs with its HoweyCoin offering. The bogus offering, with its fake whitepaper, vague business plan, promises of guaranteed returns, and false celebrity endorsements, was widely publicized in the press and served as an effective means to highlight the investment and legal risks of ICOs.²⁴

EUROPEAN UNION

Regulatory Update Authored by Covington & Burling LLP

Regulation of Blockchain

- In 2018, the European Commission (EC) has continued to express support for blockchain technology and Distributed Ledger Technology (DLT). For the EC, DLT promotes trust, making it possible to share information online, and agree on and record transactions, in a verifiable, secure and permanent way.²⁵ The EC further views trust as “becoming the most valuable — and coveted — commodity in the digital economy and society.”²⁶ It therefore places blockchain at the heart of its digital strategy in the EU.
- However, the EU has so far chosen not to regulate blockchain and DLT. It rather aims to develop a common approach to DLT for the EU, and take a global lead in adopting DLT, particularly in public sector applications. To that end, the EC wants to create the right conditions to foster the development of DLT — but also recognizes a need to establish an appropriate legislative framework, and to address any legal uncertainties it creates. To this end, the EU launched a number of blockchain initiatives in 2018.
- In February 2018, the EC launched the EU Blockchain Observatory and Forum. This initiative draws together private stakeholders and public authorities in technical and regulatory discussions about the future of blockchain in the EU.²⁷ It also serves as a knowledge hub for the EU — mapping out key initiatives, and monitoring developments in the technology.
- In March 2018, the EC published its “FinTech Action Plan.”²⁸ Among the nineteen “steps” in this Plan, the EC will work with the European Supervisory Authorities to develop a blueprint of best practices for regulatory sandboxes by Q1 2019.²⁹ It will work with the Blockchain Observatory and Forum on a comprehensive strategy for DLT and blockchain, addressing all sectors of the EU economy — and in particular identifying how to foster FinTech and RegTech applications in the EU.³⁰ The EC has also established an “EU FinTech Lab,” a forum for non-commercial exchanges between tech providers and European and national authorities.³¹
- Since April 2018, the majority of EU Member States (27 countries — excluding Croatia and Hungary, but including Norway) have agreed to form the European Blockchain Partnership (EBP).³² This group is intended to avoid fragmented approaches to DLT, ensuring interoperability and wider deployment of blockchain-based services.
- The EBP’s members are now working on a European Blockchain Services Infrastructure (EBSI) — a scalable infrastructure to support the delivery of cross-border digital public services, with high security, privacy and energy efficiency standards.³³
- The EU also continues to provide substantial financial support for the development of projects that promote the use of blockchain in the EU.³⁴

Regulation of Cryptocurrencies

- Much as with DLTs, the EU has so far held back from rushing into regulation of cryptocurrencies. Nevertheless, it is more cautious on cryptocurrencies than on DLT.
- Central bankers in Europe have been fairly critical of cryptocurrencies,³⁵ but have generally agreed that any regulation would have to be agreed at a global level.³⁶ The EC’s FinTech Action Plan commits it to monitor the devel-

opment of cryptocurrencies (the Plan refers solely to crypto-assets) and Initial Coin Offerings (ICOs) in the EU and globally, with the aim of assessing whether regulatory action at the EU level is required.³⁷ On September 7, 2018, the Finance Ministers of the EU Member States also agreed not to rush into regulating emerging cryptocurrencies in Europe.³⁸

- In March 2018, the EC also proposed a regulation on European crowdfunding services for business.³⁹ This introduces an optional EU regime that enables crowdfunding platforms to provide their services easily across the EU Single Market, for campaigns worth up to one million Euro over a period of 12 months.⁴⁰ There has been some debate as to whether ICOs should be in scope of this proposal. In principle, it is intended to be technology-agnostic, and flexible enough to cover ICOs;⁴¹ however, the European Parliament Committee's Report on the proposals seeks expressly to exclude ICOs, rather calling on the EC to consider whether these need separate regulation.⁴² It remains to be seen what form the final legislative compromise will take — most likely in early 2019.

- On May 30, 2018, the EU also adopted the Fifth Anti-Money Laundering Directive (5AMLD),⁴³ which brings custodian wallet providers (CWPs) and virtual currency exchange platforms (VCEPs) into scope.⁴⁴ As the EU Member States implement 5AMLD into national law — by January 10, 2020 at the latest — CWPs and VCEPs based in those jurisdictions will be subject to similar obligations as other financial institutions (e.g., banks). These include registering with national anti-money-laundering authorities, and putting in place policies and procedures to detect, prevent and report money laundering and terrorist financing.
- At the Member State level, different regulators classify and treat cryptocurrencies differently.⁴⁵ Some Member States classify cryptocurrency as a unit of account while others reject it as a financial instrument. Other regulators think that ICOs should be reviewed on a case-by-case basis. European regulatory authorities can be expected to issue more guidance and regulation over the coming year.

MIDDLE EAST AND NORTH AFRICA

Regulatory Update Authored by Covington & Burling LLP

United Arab Emirates

- The United Arab Emirates stands at the forefront of blockchain developments in the Middle East and North Africa region; the UAE government appears intent on becoming a regional and global leader in blockchain.
- Banking, currency, and payment and settlement systems are regulated by the UAE Central Bank and the provision of cryptocurrency-related services fall within its remit. The UAE government and Central Bank have been working to develop laws and regulations in relation to Bitcoin and blockchain. On January 1, 2017, the

UAE Central Bank published the “Regulatory Framework For Stored Values and Electronic Payment Systems,” focusing on how “to facilitate robust adoption of digital payments across the UAE in a secure manner.” The regulatory framework was initially interpreted as a ban on Bitcoin and blockchain, given its mention that “all virtual currencies [and transactions thereof] are prohibited.” However, the governor of the Central Bank, Mubarak Rashid Khamis Al Mansouri, subsequently issued a press statement declaring that, “[i]n this context, these regulations do not apply to Bitcoin or other crypto-

currencies, currency exchanges, or underlying technology such as Blockchain.” While this statement offered some comfort to the market, more regulatory certainty is needed.

Abu Dhabi

- Abu Dhabi’s recently launched common law-based free zone, Abu Dhabi Global Market (ADGM), was particularly active in terms of crypto asset regulation during 2018. Following the successful completion by ADGM’s Financial Services Regulatory Authority (FSRA) of a public consultation on the introduction of a crypto asset regulatory framework, ADGM launched in June 2018 a framework to regulate spot crypto asset activities. The framework extends to crypto asset activities undertaken by exchanges,

- In April 2018, the UAE cabinet launched the “UAE Blockchain Strategy 2021.” The strategy provides that, by 2021, 50% of UAE federal government transactions will be conducted using blockchain-based systems.

custodians and other intermediaries in ADGM. However, it does not apply to ICOs.

- Separately, ADGM’s FSRA indicated that it would determine on a case-by-case basis if a token issued pursuant to an ICO would be deemed a security. Any token deemed a security (i.e., a “Security Token”) will be subject to regulation. Additionally, any market intermediaries dealing in Security Tokens or their derivatives (or both) would need to be licensed and approved by FSRA.

Dubai

- A November 2016 report from the Dubai Supreme Legislation Committee said that the UAE “should be among the first in the region and the world to establish a legislative framework and a financial and organisational structure for [blockchain].”⁴⁶ In the same report, the Dubai Supreme Legislation Committee said it was considering “the present and future of the legislative and legal frameworks related to cryptocurrency known as Bitcoin.”⁴⁷ Aisha Bin Bishr, director general of Smart Dubai, the Emirate’s innovation office, said: “We want to make Dubai the first Blockchain-powered government in the world by 2020.”⁴⁸
- In October 2018, Smart Dubai and IBM announced the launch of the Dubai Blockchain Platform, touted as “the first government-endorsed Blockchain platform as-a-service in the [UAE].”⁴⁹ The platform is intended both to enable organizations in the UAE and globally to move from blockchain testing and development into full production; and to transform

and digitize government processes and citizen services.

- Separately, Dubai’s common law-based free zone, the Dubai International Financial Centre (DIFC), has also sought to establish itself as a leader in fintech and blockchain. In 2017, it launched “Fintech Hive,” a fintech accelerator with 11 start-ups that went on to raise \$10 million. This year’s cohort consists of 23 companies.⁵⁰
- Another Dubai free zone — the Dubai Multi Commodities Centre (DMCC), established in 2002 to enhance commodity trade flows through Dubai — also made headlines on the cryptocurrency front in 2018, by reportedly issuing Dubai gold trader Regal RA DMCC the Middle East’s first license to trade cryptocurrencies. DMCC stated that “[Regal RA DMCC] will offer storage of bitcoin, ethereum and other cryptocurrencies in a vault located in DMCC headquarters [...]”⁵¹

Bahrain

- The government of Bahrain appears intent on placing the country at the cutting edge of fintech innovations. Khalid Al Rumaihi, CEO of the Bahrain Economic Development Board (its inward investment agency), has stated that “The ability for blockchain to be adopted at country level is a huge opportunity for Bahrain to move into the spotlight as a pioneer in this space.”⁵²

Saudi Arabia

- Banking, currency, and payment and settlement systems are regulated by the Saudi Arabian Monetary Authority (SAMA), and the provision of cryptocurrency-related services fall within SAMA's remit. While Saudi Authorities are looking to provide a regulatory framework for blockchain, cryptocurrencies are illegal.
- In August 2018, SAMA issued the following statement (translated from Arabic) warning against the use of digital currencies: “The

- In March 2018, the Kingdom launched a “regulatory sandbox” for virtual currency, which initially included four digital currency exchanges. The Central Bank of Bahrain issued an authorisation to Palmex, a Dubai-based cryptocurrency exchange, to commence operations in country. In August 2018, Bahrain-based ABC Bank was granted permission to join R3, a blockchain-based consortium of leading financial institutions.

committee assured that virtual currency, including for example but not limited to Bitcoins, are illegal in the kingdom and no parties or individuals are licensed for such practices. The committee warns all citizens and residents against drifting after such illusions and get-rich schemes due to the high regulatory, security and market risks involved, not to mention the signing of fictitious contracts and the transfer of funds to unknown recipients/entities/parties.”

Morocco

- Since 2015, Morocco's new banking law has recognized digital currencies such as Bitcoin, and permitted the use of normal currencies used digitally, such as digital wallets like PayPal.

The law also defines how currencies may be used digitally in transactions, payments, and transfers, and opens the door to the legal use of cryptocurrencies.

ASIA PACIFIC

Regulatory Update Authored by CLS Group

Australia

- In late September 2018, the Australian Securities and Investments Commission published its Corporate Plan for 2018-2022. One of the action plans is to develop an “approach for applying the principles for regulating market infrastructure providers to crypto exchanges.” It is not clear whether this means the Principles for financial market infrastructures (PFMI) (which are implemented in Australia via the Corporations Act 2001).⁵³

- On November 26, Reserve Bank of Australia (RBA) Governor Philip Lowe spoke at the Australian Payments Summit about the shift toward electronic payments and a near cashless payments system. Mr. Lowe reasserted the RBA's stance that there still does not appear to be a case for issuing an electronic form of the Australian dollar, an eAUD, particularly following implementation of the New Payments Platform.⁵⁴

- On December 6, the Parliament of Australia passed the *Telecommunications and Other Legislation Amendment (Assistance and Access) Bill 2018*, widely known as the “Anti-Encryption Law,” to amend *Telecommunications Act 1997*.⁵⁵ The law grants Australian police greater powers to compel companies and websites operating in Australia to assist the government

Hong Kong

- On February 28, the Hong Kong Monetary Authority (HKMA) issued a circular to authorised institutions to draw their attention to the Basel Committee on Banking Supervision’s (BCBS) February 2018 paper on sound practices and the implications of Fintech for banks and bank supervisors. The HKMA recommends that authorised institutions study the paper carefully to understand the risks and opportunities brought by FinTech development. In particular, the circular underscores the BCBS’s considerations related to strategic risk and states that the HKMA expects senior management to assess the strategic risk facing their institutions and develop suitable plans to monitor and manage such risk on an ongoing basis.⁵⁶

Japan

- In March, the Bank of Japan (BOJ) and the European Central Bank (ECB) published a report with findings from the second phase of their joint research project on DLT — Project Stella. This phase explored how the settlement of two linked obligations (i.e. delivery of securities against payment of cash) could be conceptually designed and operated in a DLT environment. The central banks found that Delivery versus Payment (DvP) could be conceptually and technically designed in a DLT environment with cash and securities on the same ledger (single-ledger DvP) or on separate ones (cross-ledger DvP). Moreover, DLT offers a new approach for achieving DvP between ledgers, which does not require any connection between ledgers.

hack, insert malware, build backdoors and undermine encryption. Companies will face fines up to about \$7.3 million for failure or refusal to comply. As of January 2019, full implications of the new law for tech companies, including blockchain/crypto firms, are unclear as much uncertainty remains.

- In early October 2018, the HKMA published remarks from its chief executive, Norman Chan, which set forth its position that cryptocurrencies should not be considered “currency,” as they do not satisfy the three key attributes of money (medium of exchange, store of value, unit of account). Mr. Chan also indicated that the HKMA is studying the technical feasibility and merit of central bank digital currency (CBDC). However, considerably more research is needed to analyse the merits of CBDC over the current electronic and digital forms of payment in which central bank funds are used, cleared, and settled centrally. It is also necessary to assess the likely impact CBDC would have on the monetary policy transmission mechanism. The HKMA plans to share public findings from its research in due course.⁵⁷

Conceptual analysis and experiments have proven that cross-ledger DvP could function without any connection between individual ledgers — a novelty which does not exist in today’s system. However, depending on the design, cross-ledger DvP arrangements on DLT could give rise to additional challenges that would need to be addressed (i.e. principal risk, efficient use of liquidity, speed of settlement, privacy considerations).⁵⁸

- In December, the Japanese Financial Services Agency (JFSA) published a draft report that outlines a new regulatory framework for cryptoassets and initial coin offerings. The report urges stakeholders to sign up for the qualified

self-regulatory organization, the Japan Virtual Currency Exchange Association, which was accredited by the JFSA under the Payment Services Act in October. The report also indicates that specific tokens might be subject to regulation under the Financial Instruments

and Exchange Act, depending on how they are structured, and proposes regulatory measures for “deemed dealers” (companies operating crypto-exchanges while their registration remains pending).⁵⁹

New Zealand

- In 2018, the Reserve Bank of New Zealand (RBNZ) published several articles on FinTech and central bank digital currency in its Reserve Bank Bulletin. Most recently, an article was published in November 2018 that summarizes a range of FinTech innovations and explores their potential impact on banks, insurers, and financial management information systems (FMIs) from the perspective of the Reserve Bank of New Zealand regulator or supervisor of these institutions. With regard to DLT, the article lists some of the potential benefits for payments, clearing, and settlement (e.g., enhanced efficiency, transparency, resilience), but also explains that the extent of these benefits depends on the particular arrangement and may be achieved through traditional technology. DLT is not being considered by the RBNZ in

its Real Time Gross Settlement (RTGS) replacement project; although other central banks have studied the viability of DLT in wholesale payments, the article points out that no central bank has implemented a major DLT solution outside experimental conditions and highlights the conclusion from the Bank of Canada that DLT in its present state may not provide overall net benefits in comparison to current centralized systems. The article also recognizes the Bank of England’s decision that its next generation RTGS service will be compatible with DLT-based settlement and describes work from several private market participants in this area. In terms of regulatory oversight, the article explains that the new FMI framework currently being drafted will be sufficiently broad to cover innovative FMIs based on DLT.⁶⁰

Singapore

- The third annual Singapore FinTech Festival took place in November 2018. In connection with the event, the Monetary Authority of Singapore (MAS) published two reports from Project Ubin (see below). MAS also (i) issued a consultation paper on the creation of a pre-defined sandbox, known as Sandbox Express, to complement the existing FinTech Regulatory Sandbox that was launched in 2016; (ii) hosted a two-day workshop with leading international and local academics to discuss how digital currencies will impact monetary policy and financial stability; and (iii) announced several other collaboration agreements intended to promote financial inclusion and strengthen international cooperation in this area.
- MAS and the Singapore Exchange published

an industry report on Project Ubin Phase 3, which explored the feasibility of DvP settlement of tokenized cash and securities (Singapore Government Securities) across separate blockchain platforms. The work demonstrated the functional capabilities of three different blockchain pairs to establish an interledger DvP settlement system, and highlighted the need for an arbitrator for dispute resolution to maintain a fair and orderly market structure. However, further research is needed to evaluate the effects on liquidity efficiency, which will be lower than conventional market set-ups due to the underlying mechanism that locks assets to their corresponding ledgers.⁶¹

- In addition, MAS, together with the Bank of Canada and Bank of England, published

Cross-Border Interbank Payments and Settlements. As the title suggests, the report is aimed at developing further insights into the challenges and root causes of issues associated with cross-border interbank payments and settlements. The report leverages earlier work from Projects Jasper (Bank of Canada) and

Ubin (MAS) and explores hypothetical models for cross-border payments using a tokenized limited-access wholesale Central Bank Digital Currency (CBDC). The report suggests that the CBDC model may address several pain points identified in the industry, but also underscores the difficult policy considerations at hand.⁶²

Thailand

- In August, the Bank of Thailand issued a press release, formally announcing its work on Project Inthanon — a wholesale CBDC experiment built on DLT. The project is similar to

experiments conducted by the Bank of Canada (Jasper), MAS (Ubin), BOJ and ECB (Stella), and South African Reserve Bank (Khokha). A report is expected in 2019.⁶³

PART TWO

Blockchain Solutions

Strengthening Societies



EMPOWERING DIGITAL SOCIETIES

Daniel Gasteiger, Founder and Chief Executive Officer



To know what technology can do to transform governance and empower people, one need look no further than the Baltic nation of Estonia. With e-Identity at its core, citizens can access 99% of public services online. The efficiency gains enabled by the use of digital signatures saves the country 2% of GDP annually.⁶⁴ However, Estonia still remains among a select group of countries where the government has truly embraced digital technologies to transform society as a whole.

Inspired by the success of Estonia in building a digital society while embracing the newest advances in technology, Procivis aims to empower citizens globally by providing trusted electronic identity solutions built around the safeguarding and self-sovereignty of personal data. Recent technological developments such as the proliferation of smartphones and mobile internet, aided by blockchain, offer the opportunity to put identity in the digital realm firmly back in the hands of the citizens. Procivis, derived from the Greek word "pro" and the Latin word "civis" captures what the company represents, building technology "for the people".

As a first step towards turning our vision into reality, Procivis completed a full roll out of its eID+ platform for the Swiss Canton of Schaffhausen in June 2018 after a successful 6-month pilot. Through the eID+ mobile application, citizens can now access up to 40 eGovernment services through their smartphones. The potential of the eID+ platform is being recognized beyond Switzerland. The solution is now being piloted with governmental and non-governmental entities across 3 different continents.

The value of an electronic identity lies primarily in the access to services it can open for citizens. The future of Procivis is closely tied to the development of these services. With VETRI, Procivis is also developing a personal data management platform aimed at restoring the balance of power in the data economy in favor of citizens. Further, Procivis has developed a blockchain-secured eVoting prototype in collaboration with the University of Zurich aimed at enabling greater citizen participation in more areas of governance. Each of these applications form the building blocks of the citizen-centric digital future that Procivis envisions.



INNOVATIVE SOLUTIONS FOR GLOBAL IMPACT

Miles Pelham, Chairman and Founder

Until now, the blockchain and digital asset landscape has been high on promise but low on execution. To scale the potential of blockchain technology to an institutional level, Hong Kong-headquartered Diginex is building a blockchain ecosystem which aims to make digital assets more accessible, business processes more efficient, and societies more secure.

One example of this is Diginex's partnership with the Hong Kong-based business association the Mekong Club. Together we have developed a blockchain application called eMin, which helps to protect migrant workers from forced labour situations, an issue that affects ~25 million people globally.⁶⁵ With the introduction of anti-slavery regulations around the world over the past few years, companies are looking for solutions that will help them detect forced labour in their supply chains. Regulators now demand that companies provide a clear and auditable data trail to serve as evidence of

due diligence. This is a challenge for companies who often do not have full visibility into their complicated and dispersed supply chain networks.



Diginex and the Mekong Club created eMin which includes a mobile application for workers as well as a platform for companies. With eMin, workers can ensure employment contracts are maintained in their original forms, protecting themselves from the threats of contract substitution and modification. Companies can then use anonymized data to detect forced labour in their supply chains and direct their procurement practices. eMin can assist companies by adding trust, transparency and security to their supply chains, enabling them to comply with new standards and regulations. We already see high demand for blockchain-based supply chain management solutions such as eMin from corporates and NGOs and expect to see implementation at scale over the next 12 months.

MAKING THE WORLD SAFER, SMARTER AND MORE LIVEABLE WITH BLOCKCHAIN

Valery Vavilov, Founder and CEO

As blockchain technology becomes more widely adopted by businesses, organizations, and government agencies, it is increasingly important to create tools that can identify and investigate criminal activity on public blockchains.

That is why, in January 2018, the Bitfury Group launched its own blockchain analytics tool — Crystal. Designed for law enforcement and financial institutions, Crystal uses advanced analytics and data scraping to map suspicious transactions and the entities involved. Bitfury's Crystal team has used the tool to track funds

from two major exchange hacks that occurred in 2018: the Zaif hack and the Bithumb Hack. In both investigations, Crystal was able to find the real-world entity at which the majority of the stolen funds ended up.

Beyond Crystal, Bitfury has continued its efforts to build blockchain projects and partnerships that make the world safer, smarter and more liveable for everyone. In June, we partnered with the Government of Bermuda to add blockchain to the Island's land registry system. The historic



project will use Bitfury's own private blockchain framework, Exonum, to secure land titles for Bermuda citizens. In July, we launched BE BIG, a global education initiative to advance the adoption of blockchain as the technology of digital trust.

In September, we launched a new generation of bitcoin mining hardware, led by our newest bitcoin mining ASIC (application-specific integrated circuit) chip, Bitfury Clarke. And in October, we launched our new enterprise grade bitcoin miner, the Bitfury Tardis, the latest generation of our B8 mining server.

In 2019, Bitfury is exploring other emerging technologies with great potential to fundamentally change the way businesses and governments operate — like artificial intelligence and high-performance computing.

Artificial intelligence, in particular, will have a profound impact on how businesses operate, as most companies will use some form of A.I. in the next few years. McKinsey estimates that A.I. techniques could create almost \$6 trillion in value annually across nine business functions in 19 industries.⁶⁶ Of particular interest for us is that the A.I. revolution has accelerated hardware demand for high-performance computing. Over the past several years, we have created the technology and skills that we can now apply to gain a substantial share of this A.I. market.

The future is bright for blockchain and other emerging technologies, and Bitfury looks forward to working with the GBBC and others to make the world more transparent and trusted — for everyone.

SELF REGULATING INNOVATION

Junhaeng Lee, CEO

Since “cryptocurrency” and “blockchain” became the topics du jour in Korea, a constant point of discussion is Korea's surprising lack of government regulation regarding the operation of cryptocurrency exchanges — the current main point of connection between the crypto and fiat economies. In this regulatory void, there is a movement among blockchain companies to self-regulate and proactively set operating standards for the industry. Streami Inc. is at the vanguard of this movement in Korea.

Streami believes in affecting positive change through blockchain technology and is dedicated to providing solutions that bridge the crypto and fiat economies in a clear manner. Streami's cryptocurrency exchange, GOPAX, has been proactive in meeting established standards to ensure reliability and security. In 2018, GOPAX became the first crypto exchange in the world

to be ISO/IEC 27001-certified, and later became the first Korean exchange to receive K-ISMS certification from the Korea Internet & Security Agency, meeting information security standards that are expected of major Korean tech companies.

Streami has also showcased a crypto custody service, DASK, which will not compromise chain of custody for evidence purposes. This means that it can fill a current void- by creating a way for law enforcement to safely store digital assets that may be considered evidence in legal matters.

Streami has been vocal about establishing the legitimacy of blockchain technology as an industry in Korea. In October, Streami cooperated with the GBBC in organizing the



Global Blockchain Policy Conference, which brought together lawmakers from across the globe to discuss blockchain in a manner that transcends national borders. The event was held with cooperation from the Korean National Assembly, delivering a unified voice to address

the lack of legal infrastructure necessary for realizing blockchain and crypto's full potential.

Moving forward, Streami is dedicated to continuing to work towards realizing the full potential of blockchain and cryptocurrencies.

CHINA BLOCKCHAIN APPLICATION CENTER

Kevin Guo, President and Deng Di, Chairman

In 2015, the China Blockchain Application Center was founded in Beijing by the Beijing Municipal Bureau of Financial Work, the Museum of Fintech and other leading institutions in the blockchain ecosystem. The center is a public institution which aims to cooperate with relevant regulatory bodies, promote and conduct certification programs, develop standards for the blockchain industry, encourage applications of the technology in myriad industries, prevent financial risk, promote industry literacy and financial inclusiveness, and foster exchanges between experts in China and their contemporaries worldwide. In its efforts to engage regulatory and supervisory bodies in China, CBAC has hosted over a dozen internal talks with such institutions in China. These conversations have been attended by prominent political leaders and regulators - enabling the organization to establish close ties to all levels of government.

Since its founding, regional centers have been established in Hangzhou, China (2016), Silicon

Valley, USA (2017) and Dubai, the United Arab Emirates (2018).

With the support of Beijing Municipal Bureau of Financial Work and the People's Government of Haidian District, CBAC recently initiated "Beijing Blockchain Ecological Investment Fund" with initial investment of RMB 1 billion Yuan (~146,000,000 USD). Three companies have been listed and selected to become unicorn enterprises and industrial leaders.

For CBAC, this is just the start of a generational effort to nurture blockchain innovation in China and beyond. We recognize the value of bringing together innovators and regulators to create conditions which unlock future innovation. We look forward to expanding our reach and continuing to work with global partners to harness this transformative technology across the world.



Unlocking Value



INSTITUTIONAL SOLUTIONS FOR A NEW ASSET CLASS: FIDELITY DIGITAL ASSETSSM

Fidelity Digital Assets

We imagine a world, soon, where all types of assets are issued natively on a blockchain or represented in tokenized format. Institutions seeking exposure to digital assets require sophisticated services, which are widely available for stocks, bonds, and other asset types.

Fidelity Digital AssetsSM will provide secure, vaulted cold storage for bitcoin, ether, and other digital assets. We are also building multi-venue trade execution capabilities, powered by proven order matching and routing technology. All of this is backed by our dedicated client support team.

This enterprise-grade platform is built to the same exacting standard as exists in other Fidelity Investments businesses, while incorporating the unique capabilities of blockchain technology to deliver a completely new offering for institutional investors.

We began research and development efforts in 2014, started mining bitcoin in 2015, and tested our first wallet and storage solution with employees in 2016. During this time we have seen a steady evolution of institutional demand for custody and trading services.

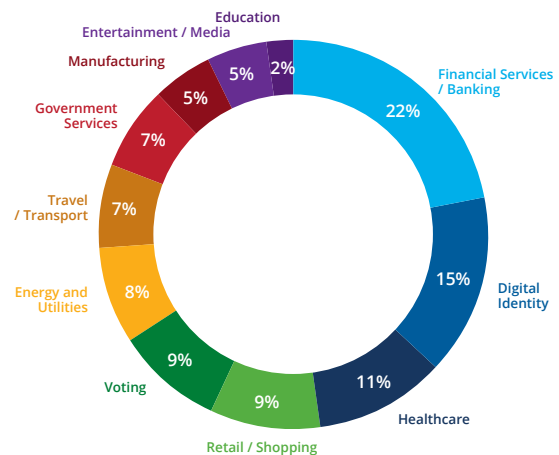
The idea for Fidelity Digital Assets emerged originally from a select team of blockchain technologists, product managers, financial and legal specialists within the firm. This group was engaged in challenging experimentation and learning across a range of potential use cases for

digital assets, which represented, initially, a departure from familiar investment tools, products and processes.

Addressing custody issues for institutional investors is one critical step in order for these markets to continue to develop. We have paired some of the best engineers in the blockchain domain with experienced business, technology, and cybersecurity professionals from Fidelity who have managed operationally intensive businesses at scale.

By building native expertise in these technologies we hope to be well-positioned to serve the needs of our clients for the long term, and to enable further advancement of the ecosystem.

Over the next five years, which of the following sectors do you think blockchain will have the biggest impact on?



Source: Citigate Dewe Rogers survey on global professional investors

INSURING THE DISTRIBUTED FUTURE TODAY

Raymond Zenkich, President and Co-Founder

BlockRe is insuring the distributed future today. The company was founded on the belief that the true promise of cryptocurrencies and more broadly cryptoassets will require a robust infrastructure — comparable to that of other contemporary financial products. A crucial piece of this infrastructure is insurance. BlockRe is the first company in the world focused exclusively on providing insurance services to protect cryptoasset holders and blockchain systems users.

Why the need for insurance?

Institutions and people holding cryptoassets increasingly expect their assets to be held by exchanges, wallet providers, or custodians who will back up their claims of security around the movement of private keys. Crypto asset holders want some level of insurance against theft or loss of private keys. Since coverages that retail customers are accustomed to such as insurances provided by Federal Deposit Insurance Corporation (FDIC)/The Securities Investor Protection Corporation (SIPC) in the United States do not apply to cryptoassets, the need for insurance in this arena is palpable.

BlockRe closes the insurance gap by providing institutional holders of cryptoassets access to a wide range of coverages, including:

- Loss of theft of private keys
- Crime and cyber
- Errors and Omissions

- Directors and Officers
- Kidnap and Ransom



We believe a strong insurance infrastructure will drive increased global adoption and growth of cryptoassets.

Why BlockRe?

Since 2017, BlockRe has been building out an exhaustive risk assessment framework that enables an underwriting model necessary to support insurance providers for cryptoassets. With over 18 categories and 500 parameters, our model is helping to grow the insurance market by providing the advanced risk modelling necessary to attract insurance companies. Similarly, the Gaming Standards Association recently adopted BlockRe's assessment framework to help the industry increase security related to blockchain solutions, reduce risk, and develop new standards.

In addition, BlockRe has been building out an exhaustive crypto-related loss event database to enhance ongoing actuarial analysis.

With its risk assessment framework, BlockRe provides specialized underwriting and claims adjusting necessary for brokers, wholesalers, and carriers in the cryptoasset/blockchain market or looking to enter it.

BRIDGING THE GAP: POTENTIAL VS. IMPLEMENTATION

Daniel Peled, Co-Founder and President



The aspiration of blockchain lies in its unique capacity to achieve two core goals: promote fair competition and reshape the role of the end user in the value chain from advertising target to critical contributor. If blockchain is able to achieve these goals, it could create a world where the asymmetrical relationship between businesses and end users is fundamentally changed to a relationship of mutual benefit.

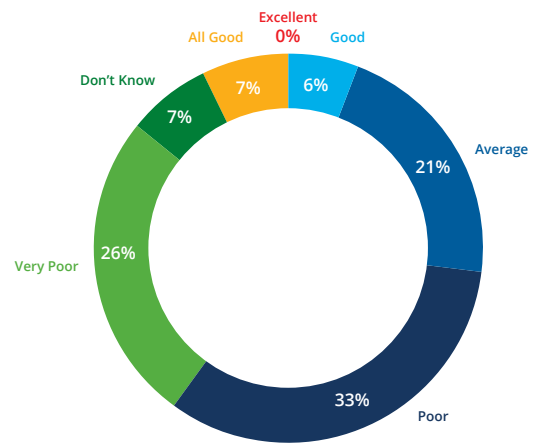
But the ability to implement a paradigm-shift of this magnitude is currently hampered by technological limitations — which make certain applications unrealistic — at least in the short term.

Orbs is a hybrid blockchain that enables businesses and developers to create high impact solutions by solving some of the key technological limits currently holding blockchain technology back. Orbs' hybrid blockchain brings enterprise quality performance and full interoperability to businesses and governments allowing them to build real blockchain backed solutions. Orbs is bridging the gap between potential and implementation — creating real value before we see perfection in public chains. Designated a Gartner Cool Vendor in 2018, Orbs continues to work on projects with world-class design partners.

And the value of blockchain technology is not limited to the business sector. In fact, lessons learned from aligning performance with decentralization are perfectly suited to governmental use cases. To harness blockchain

technology's potential to create social impact, Orbs created the non-profit Hexa Foundation. At the Hexa Foundation, the focus lies in providing visibility to government aid projects in the Middle East and globally and bringing fund transparency to humanitarian aid. Hexa will continue to work closely with regulators in the region, highlighting education and public awareness about the benefits of blockchain technology.

In general, what do you think the level of understanding of blockchain by senior directors at large established businesses/legacy businesses is?



Source: Citigate Dewe Rogers survey on global professional investors

INCREASING ACCESS

Makoto Takemiya, Co-CEO

Soramitsu (www.soramitsu.co.jp) is a boutique fintech company founded in 2016 in Tokyo, Japan, specializing in blockchain technology. Soramitsu created Hyperledger Iroha (iroha.tech), an open-source, permissioned blockchain platform that is part of the Linux Foundation's Hyperledger Project. Hyperledger Iroha is designed to allow developers to easily create digital assets and to manage pseudo-anonymous digital identities of accounts on the ledger by providing a simple data model grouping assets and accounts by domains.

Instead of forcing developers to write all the logic to manage digital assets themselves, Hyperledger Iroha has pre-defined smart contracts called "commands" that exist in the core of the system and can be called via an API to create complex applications using the Hyperledger Iroha blockchain.

Soramitsu is currently working with the National Bank of Cambodia to build a next-generation payment system using Hyperledger Iroha. This is a critically important infrastructure that will provide ubiquitous access to digital payments for all Cambodians. The Slovenian CSD, KDD,

as well as Moscow Exchange Group's CSD, NSD, have also joined with Soramitsu to create D3 (www.d3ledger.com), a decentralized digital depository for crypto assets that aims to create the world's first truly decentralized crypto custody and post-trade infrastructure solution.



In addition to working with traditional financial institutions on building products to enhance their business practices, Soramitsu also is building Sora (www.sora.org), a decentralized autonomous economy.

The goal of Sora is to democratize the issuance of new tokens on a blockchain so that projects can be empowered to receive the resources they need to develop projects, without taking

investment. The aim of this is to use the Sora token, XOR, to promote collaboration between projects in the community, rather than having many projects compete using their own token.

TOOLS FOR THE INVISIBLE HAND™

Joshua Crumb, Founder and Chair

The way societies communicate, interact and transact is undergoing a generational transformation. This isn't about innovation and disintermediation. This is a structural reorganization of the global economy resulting in the obsolescence and consequent disappearance of many companies and industries. Abaxx Technologies is accelerating this transformation by funding, developing and

deploying tools for this next generation of commerce.



Operating systems, word processing and spreadsheets represented a technological generation Abaxx refers to as the Commoditization of PCs. The current hardware dominated generation represented by Search and Social Media is referred to as the

Commoditization of Networks or Big Data. What is emerging is a software dominated generation driving the decentralization of computing, communication, and commerce; a new era Abaxx defines as the Commoditization of Trust™.

The Big Data Industrial complex is at its apex. While hardware-based networks have delivered consumer utility in the form of free services including email, GPS based maps and social media, the societal costs are becoming profound. In this era of free services the user became the product rather than the customer. Centralized computing and data silos have created unsecure networks, a veritable surveillance state, oligopolistic industries and the erosion of corporate privacy and personal liberty.

Trustless Ledgers including Blockchain, Identity Protocols, and Smart Contracts are the primary enablers commoditizing trust, standardizing

commerce and eliminating needless intermediary service providers: banks, insurers, legal, accounting, and administration. Abaxx is contributing to this new economy in which marketplaces and exchanges drive dynamic counterparty discovery, encryption on every transaction and self organizing markets where the user is self sovereign and data is a private portable asset.

Abaxx invests alongside partners in the development and deployment of internet architecture and protocols supporting decentralized commerce, computing and exchanges, secure in the knowledge that marketplaces are the appropriate structure enabling free market global commerce in this emerging era. A platform for the Secure Disclosure of Intellectual Property and a Commodity Exchange initially focused on Global Energy Markets launch in 2019.

THE POWER OF PERSONAL DATA

Serafin Lion Engel, CEO and Founder

Through blockchain technology, Datawallet empowers users to take control of their personal data (which they rightfully own); we provide a mechanism for users to extract the value from their data. This value can be a better online experience, better products or permissioning your data for a reward.

Users create self-sovereign encrypted Datawallets, to which only they have access. With Datawallet, users decide with whom to share their and allows safer storage of personal data by eliminating centralized, potentially vulnerable databases. The data users provide is verified and immutable because Datawallet hashes the entire data set the moment data

is added to a user's Datawallet. If someone needed to challenge the veracity of the data set, Datawallet could compare the hash generated from the data set to the hash from the initial creation.

Our encrypted smart contracts provide immutable rules for data exchanges ensuring users know exactly what they will receive for permissioning specific information. Blockchain technology can ensure that access to data is transparent-and Datawallet is dedicated to making sure personal data is only accessible with data owners' explicit permission.



THE TOKENIZATION OF ASSETS

Harris Fricker, President & CEO-GMP Capital Inc.

Blockchain solutions have been proposed and successfully implemented in a number of countries for asset rights, particularly within the realm of property rights. The next stage of development in this space will be the tokenization of assets from the real world, where interested parties can sell or acquire fractional ownership in an asset rather than being required to sell or buy the entire asset. This is accomplished through the creation of a digital token linked to the asset of value.

The tokenization of assets provides a number of unique advantages and benefits. Fractionalization of assets enables faster trades, frameworks for complex ownership rights, cost reductions and, most importantly, transparency. This is all achieved while simultaneously creating broader liquidity in the markets and improving and expanding access.

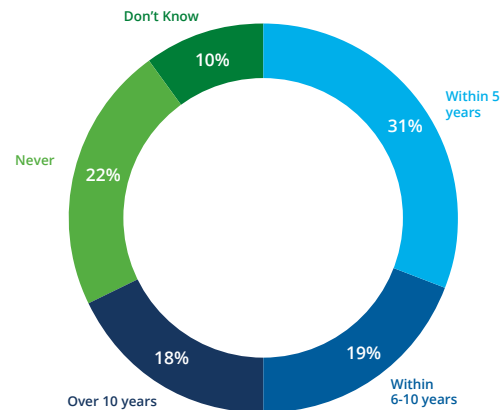
Companies, including real estate developments, have already started distributing SEC Compliant cryptocurrencies that represent stakes in the assets of their business. As the infrastructure in the space matures, we believe, the practice of asset tokenization will become commonplace. The global real estate market is valued in excess of US\$200 trillion; over the next decade, we see this largely illiquid asset class becoming liquid with ownership rights recorded using blockchain technology and traded on a tokenized basis.

GMP Securities has been working very closely to educate and advise institutional asset

managers as well as real estate developers in the space as they strive to create tokenized real estate security offerings. Recognized as a leading global player in matters relating to distributed ledger technology, GMP Securities offers a broad range of advisory and capital raising services and transactional expertise to promising entrepreneurs, established companies and the industry's top investors. In recognition of our leadership in the space, GMP was awarded Brendan Woods' blockchain investment banking team the Top Gun distinction in 2017.



When do you think major listed companies will start to have heads of blockchain sitting on their board?



Source: Citigate Dewe Rogers survey on global professional investors



EMPOWERING PEOPLE

Julius Akinyemi, CEO and Co-Founder

Unleashing Wealth in Nations (UWIN) is a for-profit, fintech company that delivers next-generation market infrastructure products and services to those most vulnerable and excluded from formal financial markets. We provide all classes of Digital Assets in our “eRegistry” and blockchain-enabled federated marketplace, which includes portable identity management. UWIN uses existing and emerging technologies (i.e. simple, front-end mobile/tablet user interaction, AI, cloud storage and blockchain back-end architecture) that enables unprecedented transparency. We apply our proprietary “RIndex”- the reputation Index that measures the Trustworthiness of producers and participants alike. Our distributed systems architecture includes IoT (for physical commodities) and big data/machine learning analytics which provide valuable insights into the market data and the registered digital assets garnered. This is a significant innovation as detailed source market data does not exist today in a validated, ‘easy to consume,’ recorded form.

Our initial set of services focuses on the registration and authentication of a country’s indigenous assets; with its newly defined Sovereign IP by the World Intellectual Properties Organization (WIPO) — WIPO’s Legal Framework

for this new class of asset is being developed in coordination with UWIN’s CEO, Julius Akinyemi. We will record country ownership of natural/indigenous plants and, by doing so, “commoditize” the asset and unlock the wealth behind those assets. Our initial offering will also include the monetization of such assets for rural producers so they are better able to leverage the value for financing and collateral recognition/asset ownership valuation.



Services include 1) identity registration 2) asset and land registry 3) collateral verification and reputation index services 4) price feeds — local and international 5) digital trading marketplace(s) 6) confirmation, settlement, delivery, and payment services and 7) credit and insurance services.

This is just the beginning of an effort to fundamental expand the global economy. UWIN will continue to work with partners across sectors and technologies to offer critical services to populations historically excluded — expanding, adapting and tailoring offerings for each new market.

TURBOCHARGING THE FUTURE OF RENEWABLES

Dr. Jemma Green, Co-Founder and Chairman

Power Ledger kicked a lot of goals in 2018. We received endorsement from Sir Richard Branson after taking home the crown in his Extreme Tech Challenge where hundreds of startups competed with their world-changing innovations. We launched our platform in Thailand, Australia, Japan and the United States. And we announced our new product, Asset Germination Events

(AGE); we believe AGE will fundamentally change the game in financing renewable energy assets. And we’re just getting started.

Our other products enable electricity trading, carbon markets and energy asset financing. At



Power Ledger



Power ledger, our products work together to achieve our mission of democratizing power. And our core business can be distilled into three main parts:

1. The focus of our μ Grid, xGrid and PowerPort products is to facilitate electricity trading. This includes behind and across meter peer-to-peer trading and electric vehicle charging. In 2018, we deployed projects in Australia, Thailand, and the United States utilizing these three platforms.
2. We're also operating in carbon markets. Our collaboration with Silicon Valley Power in California's second-largest electric vehicle (EV) charging facility highlights our efforts to automate part of the issuance process. We are working to incentivize EV owners to charge their cars from solar during the day, rather than at peak hours from fossil fuels. In doing so, they will receive carbon credits or discounts on their charging.

3. Finally, we offer blockchain-based energy asset financing. Typically in the energy industry, the speed of organic growth is glacial but our planet doesn't have time to wait for change. If we're going to turbocharge this growth in renewables, we need investment, so we have pioneered our own product to do this.

Asset Germination Events (AGE) will use blockchain and crypto to provide new sources of capital for funding energy projects. We will do this by procuring large-scale assets and fractionalizing them on the blockchain to allow for investment and co-ownership by everyday people.

We aren't trying to change the laws of physics — but we are changing the market so the economics point to renewables and value flows to consumers. Low cost and low carbon electricity is what we stand for. We can't wait to make an even bigger impact in 2019.

EMPOWERING CREATORS

Heidi Pease, CEO and Co-Founder

Creating is the ultimate expression of humanity. Yet artists, entertainers, and creators face significant hurdles establishing ownership over what they create, being compensated in a fair and transparent manner, controlling how they promote and engage with their patrons and growing their business from fundraising to community building. Proof-of-Art removes business frictions and provides the business tools needed so creators can do what they do best — create!

Proof-of-Art is an interactive social enterprise and community building platform providing business solutions for artists, entertainers, and all types of creators. Our platform removes business frictions by:

- engaging artists, patrons, and corporate sponsors in fundraising and marketing initiatives which creates an innovative holistic ecosystem
- offering business templates such as project budgets, legal contracts, accounting forms, etc.
- connecting with mentors and verifying contractors through a reputation index which does not exist today. In fact, Proof of Art has started developing a reputation index with partners. Our goal is to build it as a self-sustaining index run by the community of contributors.



Proof of Art



- collecting and analyzing data for artists and corporate sponsors at the election of the data provider
- providing inventive target marketing and analytics of project promotion and corporate advertising which solves the “advertising black-hole”
- giving patrons opportunities to monetize their data

Community building is done through an innovative tokenized gaming structure for patrons providing micro-rewards for: real-time project engagement such as voting; project promotion within their social networks; providing user data to corporate sponsors and artists; advertising views and content sharing within social media.

Proof-of-Art’s initial use case is focused on artists and entertainers. However, the platform

will eventually be made available for all types of content creators, project developers, and community builders such as athletes, designers, non-profits, researchers, etc.

Proof-of-Art was conceived at Sir Richard Branson’s inimitable Blockchain Summit, a gathering of tech experts, world leaders and global changemakers addressing blockchain technology use cases for social impact. Since then, several partners and advisors from the Summit have joined the Proof-of-Art family.

The instinct to build is deeply ingrained in our species. It has driven humans to traverse oceans, populate continents and shape cities. But how does humankind move from instinct to reality? Before they changed the world, longboats and skyscrapers were only ideas. What enables our collective productive drive?

Conclusion

No matter setbacks on the path, blockchain continues to inspire innovators to question unexamined systems and norms historically accepted as adequate. The technology is compelling a generation of new solutions specifically built to address perennial inequities and foundational frictions across geographies and industries.

This coming year will be pivotal for blockchain as the technology continues to mature and evolve and as individual jurisdictions determine how they intend to engage with the global community. This interplay will make up the steps between promise and impact — and will hopefully contribute to an ever-growing number of real-world applications which are unlocking value for varied industries and sectors of society.

2019 represents an opportunity to continue to build value while simultaneously breaking down superfluous barriers and silos, creating more fair, functional and efficient societies in the process. We look forward to continuing to work together and to chronicling our collective progress in next year's report.

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Thank you for joining us as we advocate for thoughtful regulation, innovative solutions, and cross-border partnerships around the globe.

- 1 | For example, the Electronic Fund Transfer Act, 15 U.S.C. §§ 1693 et seq., and Regulation E, 12 C.F.R. Part 1005, prescribe requirements for electronic fund transfers, such as the use of ATM cards and other electronic access devices. These requirements would likewise apply to an electronic fund transfer process that leveraged the use of blockchain or another DLT.
- 2 | In 2018 alone, Arizona, California, Colorado, Connecticut, Delaware, New York, North Carolina, Ohio, Tennessee, Vermont, and Wyoming enacted or adopted blockchain legislation.
- 3 | See FinCEN, FIN-2013-G001, Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies (Mar. 18, 2013).
- 4 | See Prepared Remarks of FinCEN Director Kenneth A. Blanco, delivered at the 2018 Chicago-Kent Block (Legal) Tech Conference (Aug. 9, 2018).
- 5 | U.S. Dept't of the Treasury, Opinion Letter to Senator Ron Wyden on Oversight and Enforcement Capabilities of FinCEN over virtual currency financial activities (Feb. 13, 2018).
- 6 | Executive Order 13827, Taking Additional Steps to Address the Situation in Venezuela (Mar. 21, 2018).
- 7 | See FinCEN, FIN-2018-A006, Advisory on the Iranian Regime's Illicit and Malign Activities and Attempts to Exploit the Financial System (Oct. 11, 2018); U.S. Department of Treasury Press Release, Treasury Designates Iran-Based Financial Facilitators of Malicious Cyber Activity and for the First Time Identifies Associated Digital Currency Addresses (Dec. 21, 2018).
- 8 | See, e.g., CFTC v. Patrick K. McDonnell and Cabbagetechnology, Corp., No. 18-CV-0361 (E.D.N.Y. Jan. 1, 2018).
- 9 | See CFTC Backgrounder on Oversight of and Approach to Virtual Currency Futures Markets (Jan. 4, 2018).
- 10 | See, e.g., *In the Matter of TokenLot, LLC, Lenny Kugel, and Eli L. Lewitt*, SEC Docket No. 3-18739 (Sept. 11, 2018).
- 11 | See, e.g., Self-Regulatory Organizations; NYSE Arca, Inc.; Order Disapproving a Proposed Rule Change to List and Trade the Shares of the ProShares Bitcoin ETF and the ProShares Short Bitcoin ETF, SEC Release No. 34-83904 (Aug. 22, 2018) [1] See, e.g., NYDFS.
- 12 | See, e.g., NYDFS, DFS Grants Virtual Currency And Money Transmitter License To NYDIG Execution, LLC (Nov. 14, 2018).
- 13 | New York is the only state with a license available specifically for cryptocurrency providers. It has been particularly focused on cryptocurrency exchange's vulnerabilities to fraud. This concern was spurred by an inquiry launched by the New York Attorney General, which resulted in the Virtual Markets Integrity Initiative Report, which concluded in part that protections for customers on cryptocurrency exchanges are often limited.
- 14 | See IRS Announces the Identification and Selection of Five Large Business and International Compliance Campaigns (July 2, 2018).
- 15 | See OCC, Policy Statement on Financial Technology Companies' Eligibility to Apply for National Bank Charters (July 31, 2018); OCC, Considering Charter Applications From Financial Technology Companies (July 2018).
- 16 | <https://www.sec.gov/litigation/investreport/34-81207.pdf>
- 17 | <https://www.sec.gov/litigation/admin/2017/33-10445.pdf>
- 18 | <https://www.sec.gov/news/testimony/testimony-virtual-currencies-oversight-role-us-securities-and-exchange-commission>
- 19 | <https://www.loc.gov/item/usrep328293/>
- 20 | <https://www.sec.gov/news/speech/speech-hinman-061418>
- 21 | *Id.*
- 22 | <https://www.sec.gov/news/press-release/2018-264>
- 23 | <https://www.sec.gov/news/public-statement/digital-asset-securities-issuance-and-trading>
- 24 | <https://www.investor.gov/howeycoins>
- 25 | See <https://ec.europa.eu/digital-single-market/en/blogposts/question-trust-eus-blockchain-challenge>.
- 26 | *Ibid.*
- 27 | See <https://ec.europa.eu/digital-single-market/en/eu-blockchain-observatory-and-forum>.
- 28 | <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0109>.
- 29 | *Ibid.*, §1.3.
- 30 | *Ibid.*, §2.3.
- 31 | *Ibid.*, §2.4. See also http://europa.eu/rapid/press-release_IP-18-1403_en.htm?locale=en.
- 32 | https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=50954. See <https://ec.europa.eu/digital-single-market/en/news/european-countries-join-blockchain-partnership>;
- 33 | See further <https://ec.europa.eu/digital-single-market/en/blockchain-technologies>.
- 34 | To date, EUR 83 million have been allocated by the EU to blockchain related projects, and up to EUR 340 million could be committed from 2018 to 2020: see <https://ec.europa.eu/digital-single-market/en/blockchain-technologies>.
- 35 | For example, in March 2018, Bank of England Governor Mark Carney called them "failing", and "bad stores of [...] value" whose "prospects of replacing fiat money are tenuous at best": see <https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/the-future-of-money-speech-by-mark-carney.pdf>.
- 36 | For example, for Germany, see <https://www.reuters.com/article/us-bitcoin-regulations-germany/any-rule-on-bitcoin-must-be-global-germanys-central-bank-says-idUSKBN1F420E?il=0>; for France, see https://www.lesechos.fr/15/01/2018/lesechos.fr/0301151100963_le-gouvernement-nomme-un-monsieur-bitcoin-.htm (in French).
- 37 | See <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0109>, §1.1, and in particular the third recommendation therein.
- 38 | They rather agreed that "clear rules of the game [are needed ...] to make crypto assets usable as financial instruments, and not [...] excessive regulation": Statement by Austrian Federal Minister of Finance, Hartwig Löger, following the informal meeting of economic and financial affairs ministers (ECOFIN) under the Austrian Council Presidency, see <https://www.eu2018.at/latest-news/news/09-07-Federal-Minister-L-ger-Europe-is-working-on-rules-and-regulations-for-crypto-assets-to-support-the-development-of-the-sector.html>.
- 39 | <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52018PC0113>.
- 40 | According to the EC, "instead of having to comply with different regulatory regimes, platforms will have to comply with only one set of rules, both when operating in their home market and in other EU Member States. For investors the proposal will further provide legal certainty as regards the applicable investor protection rules": see http://europa.eu/rapid/press-release_MEMO-18-1423_en.htm.
- 41 | See the EC's Impact Assessment, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_7049_2018_ADD_2&from=EN, at 54.
- 42 | See <http://www.europarl.europa.eu/sides/getDoc.do?type=REPORT&mode=XML&reference=A8-2018-0364&language=EN>; Recitals 11a, 15a and 15b.

- 43 | <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX-%3A32018L0843>.
- 44 | See http://europa.eu/rapid/press-release_STATEMENT-18-3429_en.htm
- 45 | For a broad overview of relevant regulatory initiatives, see <http://bruegel.org/wp-content/uploads/2018/09/PC-2018-14-online-annex.pdf>. Note that this is the annex to a paper prepared by Bruegel, a Brussels-based think tank, ahead of the September 7, 2018 Meeting of EU Finance Ministers discussed above. That paper recommended the regulation of crypto assets, which was rejected by the Finance Ministers – but this debate remains open in Europe. For the full Bruegel paper, see http://bruegel.org/wp-content/uploads/2018/09/PC-14_2018.pdf.
- 46 | See <http://slc.dubai.gov.ae/en/AboutDepartment/News/Lists/NewsCentre/DispForm.aspx?ID=260&ContentTypeld=0x-01001D47EB13C23E544893300E8367A23439>.
- 47 | *Ibid.*
- 48 | See <https://www.ccn.com/dubai-plans-first-blockchain-city/>.
- 49 | See <https://newsroom.ibm.com/2018-10-30-Smart-Dubai-and-IBM-to-Offer-the-First-Government-Endorsed-Blockchain-Platform-in-the-Middle-East>.
- 50 | See <https://www.difc.ae/newsroom/news/20-innovative-tech-solution-pilots-emerge-second-fintech-hive-accelerator-programme/>.
- 51 | See <https://www.dmcc.ae/news/worlds-first-deep-cold-storage-crypto-commodities-launched-regal-assets-dubai>.
- 52 | See <https://www.arabianbusiness.com/bahrain-in-talks-with-singapore-on-blockchain-pilot-665012.html>.
- 53 | See <https://www.bis.org/cpmi/publ/d101a.pdf>
- 54 | See <https://www.bis.org/review/r181126a.htm>
- 55 | See https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bld=r6195
- 56 | See <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180228e1.pdf>
- 57 | <https://www.bis.org/bcbs/publ/d431.htm>
See <https://www.bis.org/review/r181004d.pdf>
- 58 | See https://www.ecb.europa.eu/pub/pdf/other/stella_project_leaflet_march_2018.pdf?dd1a3f9ccad2e9e4a7e169b37f0888ee-https://www.ecb.europa.eu/pub/pdf/other/stella_project_report_march_2018.pdf?dc7411d37fe3f659b9ed5cefaec725a4
- 59 | https://www.fsa.go.jp/news/30/virtual_currency/20181024-1.html
- 60 | See <https://www.rbnz.govt.nz/research-and-publications/reserve-bank-bulletin/2018/rbb2018-81-12>
- 61 | See <http://www.mas.gov.sg/~media/ProjectUbin/Project%20Ubin%20DvP%20on%20Distributed%20Ledger%20Technologies.pdf>
<http://www.mas.gov.sg/News-and-Publications/Media-Releases/2018/MAS-and-SGX-successfully-leverage-blockchain-technology-for-settlement-of-tokenised-assets.aspx>
<http://www.mas.gov.sg/Singapore-Financial-Centre/Smart-Financial-Centre/Project-Ubin.aspx>
- 62 | See <http://www.mas.gov.sg/News-and-Publications/Media-Releases/2018/Assessment-on-emerging-opportunities-for-digital-transformation-in-cross-border-payments.aspx>
<http://www.mas.gov.sg/~media/ProjectUbin/Cross%20Border%20Interbank%20Payments%20and%20Settlements.pdf>
- 63 | See <https://www.bot.or.th/Thai/PressandSpeeches/Press/News2561/n5461e.pdf>
- 64 | <https://e-estonia.com/wp-content/uploads/updated-facts-estonia.pdf>
- 65 | International Labour Organization. (2017). Global Estimates of Modern Slavery. Retrieved August 20, 2018, from http://www.ilo.org/wcmsp5/groups/public/—dgreports/—dcomm/documents/publication/wcms_575479.pdf
- 66 | See <https://www.mckinsey.com/featured-insights/artificial-intelligence/visualizing-the-uses-and-potential-impact-of-ai-and-other-analytics>



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