



Life of a coin

Shaping the future of
crypto-asset capital markets

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Executive summary

Crypto-assets experienced a breakout year in 2017. Cryptocurrencies ended the year in a bubble, new crypto-asset issuance surpassed venture capital (VC) funding,¹ and many diverse investors raced to incorporate various tokens into their portfolios. The market capitalization of crypto-assets has since fallen by approximately 75%,² demonstrating the scale of the volatility that can be seen in such a short space of time.

While the largely irrational exuberance of 2017 has had its direct benefits, sparking public interest in the promise of distributed ledger technology (DLT) and helping to fund a great deal of innovation in the space, ultimately, it has proved to be a distraction. Much of the public discussion has centered on cryptocurrencies (particularly bitcoin) as a replacement for fiat money and as a speculative vehicle.

Like many industries, the crypto-asset industry has suffered from a number of incidents relating to cybercrime. However, in a way that is quite unlike other industries, the digital assets held in vaults of participants within the industry are often vulnerable to being stolen, presenting a particular risk requiring mitigation. The crypto-asset industry has also shown that it is not immune to financial crime, specifically money laundering and terrorist financing, and this has spurred increased scrutiny in the anti-money laundering (AML) and know-your-customer (KYC) considerations that the industry adopts. The European Parliament announced the Fifth Anti-Money Laundering

Directive³ on 19 April 2018, and this has extended AML and counter-terrorist financing rules to virtual currencies, including to those entities that provide services of holding, storing and transferring virtual currencies.

This framing leads many to the wholesale dismissal of crypto-assets as technologically flawed, unnecessary or even subversive. In the process, it obscures their capacity to enable new business models, drive development in capital market infrastructure and help increase the depth of European capital markets to the benefit of small and medium-sized enterprises – the economy's main drivers of innovation and employment.

For decades, EY has been active in capital markets and has recently built out its DLT capabilities. Our purpose in preparing this report is to demystify crypto-asset capital markets and draw references, where relevant, to insights from our interactions with market participants that are at various stages of developing new technologies and attracting investor interest.

¹ Calculated as c.US\$7.5b, surpassing the c.US\$2.5b of equity financing raised by distributed ledger technology companies. Data taken from #Crypto Utopia - The \$20 billion Cambrian explosion of tokenized digital assets, and the emerging infrastructure being built to support them, Autonomous NEXT, Lex Sokolin and Matt Low.

² Calculated as a decline from US\$823.9b on 7 January 2018 to US\$213.1b on 26 September 2018, a drop of 74.1%. Data taken from CoinMarketCap (accessed via <https://coinmarketcap.com/>, 26 September 2018).

³ Directive (EU) 2018/843, European Union (accessed via <https://eur-lex.europa.eu/legal-content/EN/TX/?uri=CELEX%3A32018L0843>, 13 November 2018).

For the purpose of this paper, our focus is primarily on the European regulatory landscape. The wide-ranging views discussed throughout are supported by reference to a range of familiar concepts from more established capital markets and to specific pieces of European legislation. They cater to a broad audience: from those involved in issuance through to secondary market trading and investment in crypto-assets.

Different types of tokens are being developed in the market; some issued in a token sale or initial coin offering (ICO) and others representing off-chain assets (where the value of such assets resides outside of the blockchain, e.g., in the case of physical assets, such as a building). This report focuses on the tokens that an organization issues to investors and analyzes the various stages of capital markets that may affect this activity. Another recently published EY paper, *Initial Coin Offerings (ICOs): The Class of 2017 - one year later* also addresses token issuance from 2017 to 2018.

In applying our knowledge from capital markets to crypto-assets, we have identified nine key themes around token issuance, crypto-asset exchanges and investment. Our intent is not to offer a formal legal or regulatory analysis, or indeed to identify every possible legal and regulatory consideration, but to highlight key areas where market practice might need to evolve and where regulators could focus their efforts on developing new policies. We aim to highlight the interesting topics and issues that we believe will shape the future of crypto-asset capital markets across these themes:

Primary markets: token issuance

1. **Explained:** investors demand clear explanations to better understand the risks and opportunities of any investment.
2. **Accountable:** those involved in ICOs should be accountable for the quality of the issuance and associated disclosures.
3. **Comprehensive:** investors need a wide range of information to evaluate an ICO without creating excessive complexity.

Tokens may or may not constitute financial instruments, but they can play a pivotal role in allocating capital to meaningful activities. Although some of the stages (issuance, listing and trading on exchanges, and investment) may apply to other types of tokens,⁴ our analysis centers on utility tokens, which an investor may exchange for some type of resource, and security tokens, which are akin to a digitized stock.

While security tokens represent an interesting new development in technology, other types of tokens (particularly utility) represent a more significant departure from established frameworks and best practices. Some do not fit the standard investing paradigm, complicating the issue of how to approach them from a regulatory perspective. Many ICO token issuances differ from conventional securities issuances, introducing new concepts relating to smart contracts and the bearer nature of assets created.

Secondary markets: crypto-asset exchanges

4. **Transparent:** principles and parameters of a crypto-asset exchange (along with capital and liquidity pools) may be attractive to issuers, investors and regulators with supervisory responsibility.
5. **Liquid:** the market should be liquid, with a healthy volume of bids and offers, creating conditions for low spreads and minimal volatility.
6. **Orderly:** trading on exchanges should be orderly, offering fairness, reliability and efficient operations.

Different types of exchanges have emerged to serve the crypto-asset sector, offering diverse services and operating models. These exchanges exhibit varying forms of centralization or decentralization, in some ways mirroring the concepts that have underpinned crypto-assets.

The word "exchange," however, can fail to convey the scope of some of these entities' activities. Exchanges provide a variety of products and services beyond simple order book-based trading.

⁴ In a previous paper, we referred to utility tokens as miniature autocratic government (MAG) tokens, but for the purposes of this paper and for ease of reference, we adopt the more widely used, if less expressive, term.

For example, some crypto-asset exchanges serve as “wallets,” providing a storage facility for the assets. This creates an additional parallel with other types of financial institutions, such as banks or depositaries, and raises a further range of topics for consideration, such as rights and responsibilities relating to these assets.

As public interest in crypto-assets has grown, crypto-asset exchanges have sprung up to facilitate both the exchange of existing fiat currency holdings for crypto-assets, as well as crypto-assets recorded on a particular distributed ledger for those recorded on another. This ease of access to trade on many centralized exchanges, rich functionality, high volatility and prospect of high returns has attracted traders to enter the crypto-asset market. These dynamics are also of particular interest to regulatory authorities responsible for supervision.

Investors and collective investment schemes

7. **Accessible:** crypto-asset funds need to meet certain criteria relating to accessibility.
8. **Suitable:** investments should be suitable for the audience they are designed to address.
9. **Understandable:** while acknowledging that capital may be at risk, investments should be able to be understood by those considering investment.

The increasing professionalism of crypto-asset investing has led to the emergence of strategies similar to those seen in traditional capital markets. These include both active strategies (venture capital (VC) investing or (algorithmic) trading) and passive ones, such as indexing. Fund structures range from investment trusts to limited partnerships of the type seen in private equity and VC.

Given that some tokens are securities, providers of crypto-asset investment advice and portfolio management services at the very least run a risk of falling within the scope of regulation. If nothing else, that should compel them to develop skills and adopt practices equivalent to those expected of their conventional financial market counterparts.

Observations from our analysis

We have observed that many market participants make little or no distinction among the crypto-assets they deal with. Crypto-asset exchanges tend to list different types of crypto-assets side by side. Moreover, the significant differences in quality and length among whitepapers are not necessarily correlated with the nature of the token being offered. This raises questions regarding the extent to which financial market regulatory principles should be adhered to in utility token issuance, exchange and investment.

The European Union adopts a tiered approach to its regulation of investment schemes, credit institutions and trading venues – and offers a framework for proportionate disclosure by issuers. Certain principles and regulations could be applied directly or used as a source of inspiration for crypto-asset capital market standards. We envision that, given the right set of careful policy choices, a crypto-asset capital market could emerge such that investors are protected while the burden on issuers remains broadly unchanged and regulatory uncertainty is eliminated.

Overall, we believe there is a good argument to suggest that crypto-assets have an important role to play in the digital global economy. It is our hope that this report will be of interest to regulators, financial services firms, investors and other potential market players as they consider alternative financing models and DLT to drive meaningful innovation.

Introduction

The promise and challenges of tokenomics

We acknowledge that the path to delivering on the promises of enabling new business models, driving capital market infrastructure development and increasing the depth of European capital markets is fraught with risks.

However, the scale of potential benefits compels us to contribute to the discussion of how best to mitigate the risks and enable meaningful innovation to thrive. Policymakers seem to share this view.

In March 2018, the European Commission (EC) presented a proposal to harmonize regulation of crowdfunding across borders as part of its FinTech action plan. This plan aims to make financial markets *“more integrated, safer and easier to access,”* by using *“rapid advances in technology such as blockchain”* to *“benefit consumers, investors, banks and new market players.”* Crowdfunding is already part of the EC’s capital markets union action plan. These facts suggest that alternative financing models may prove to be integral to Europe’s mission to deepen its capital markets. Experience from the UK, meanwhile, indicates that the guided emergence of proportionate regulation in this area can play an important role.

Distributed ledgers, crypto-assets and financial innovation

A distributed ledger can remove the need for a trusted central authority. While the public debate typically equates that central authority with a government or a central bank, this constitutes a very narrow view. A broader, more meaningful conceptualization may be that DLT allows the automation of processes and verification of records across multiple firms (i.e., in an environment of limited trust). In that case, DLT’s impact can range from saving financial market participants

billions of dollars in record-keeping and reconciliation costs to enabling new, networked business models that extend to a consumer-to-consumer level.

How does that relate to the crypto-assets embedded within distributed ledgers? Different types will have different roles in the development of capital markets, and many will have none at all. For example, one might cite Bitcoin’s energy intensity, scalability issues and limited functionality, or the clearly speculative nature of some ICOs, such as the so-called Useless Ethereum Token.⁵

However, Ethereum illustrates that even a cryptocurrency can be integral to new business models and process automation. Ethereum enables entrepreneurs to set up decentralized applications by encoding processes into its public ledger as “smart contracts.” Its native cryptocurrency, ether, facilitates the immediate payment for their execution and serves as a necessary incentive to maintain the integrity of the distributed ledger. One might cite Etherisc’s automated flight delay insurance⁶ as an example of a “real-life” implementation of technology that has moved beyond the proof-of-concept stage.

In financial services, Ripple has attracted incumbent banks’ interest thanks to its potential to streamline payments and counterparty risk management. Ripple effectively creates a digital version of the hawala network, a payment system based

⁵ “Useless Ethereum Token”, *Useless Ethereum Token*, <https://uetoken.com>, accessed 26 November 2018.
⁶ “Etherisc”, *Etherisc*, <https://etherisc.com>, accessed 26 November 2018.

on a series of trusted intermediaries that has been used in the Arab world for centuries. Its native cryptocurrency, XRP, goes a step further by enabling immediate payment where no “trust line” can be found (e.g., where there is no correspondent banking relationship).

Tokens present opportunities and risks

Beyond cryptocurrencies lies the diverse world of tokens, which may or may not constitute financial instruments but can play a pivotal role in allocating capital to meaningful activities.

One example is SONM, a decentralized fog computing platform designed to enable individuals to provide spare processing power to those who need it, which facilitates computing, network and storage services between end devices and the cloud. The low opportunity cost enables low prices, and the processing power can be substantial - comparable with the world's fastest supercomputers. This translates into a low-cost resource for small businesses, especially those developing artificial intelligence (AI) and data analytics capabilities, as well as for scientists developing cures for diseases such as cancer and Alzheimer's. This was demonstrated by an older (non-DLT) project called Folding@home, which was designed as a volunteer initiative allowing distributed atomic-level simulations of protein folding, achieving speeds of up to 135 quadrillion floating point operations per second (PFLOPS) and directly contributing to 139 scientific research papers. By contrast, the SNM token allows computing power providers to receive a share of the network's profits based on their efforts - analogous to an ordinary share, but in a new type of business.

Storj and Filecoin constitute similar concepts supported by a very different type of token. In each of these cases, the token issuer's system enables peer-to-peer sharing of hard drive storage space in exchange for fees payable only in the native token. Steemit is a variation on this theme, which focuses on replacing the user data-based business model of established social networks with one that rewards users for posting and curating content - again through the use of a native token. The value of such tokens is

supported by a combination of their finite supply and user demand for the service offered, though the tokens do not constitute a claim on the issuing business. In effect, the token functions as a limited-purpose currency. This type of token constitutes a novel and intriguing financing tool. However, risk mitigation must be a key focus if this type of issuance is to thrive, as many tokens are issued before the underlying platform is developed.

Crypto-assets have a place in the digital economy

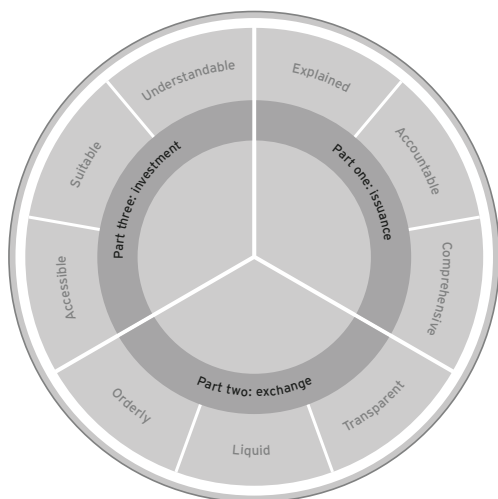
But what makes crypto-assets integral to these innovative projects? The answer may vary by project; however, it revolves around a number of key characteristics of digital assets and their role in the digital economy. These include instant credit-risk-free value transference, the enablement of fractional ownership and securitization of assets, the absence of intermediaries (and associated costs), the ability to program automated features or restrictions into the network (e.g., smart contracts), the absence of a single point of failure, and the fact that transactions can be out in the open and verifiable. In an ever more digital global economy, we believe that new and truly digital media of exchange (i.e., crypto-assets) will inevitably have a role to play.

In the above mentioned examples, both the service (e.g., computing power, hard drive space or original content) and the corresponding remuneration are transferred through the ledger, simultaneously and in minute increments. For example, even a simple IoT device such as a smart refrigerator located in Lima, Peru, can provide its small amount of idle processing power to a researcher at the University of Nairobi, Kenya, while ensuring that its owner is remunerated for the service at its market price. The insertion of an off-ledger payment process would introduce intermediation cost and credit risk which, at worst (and most certainly in the example given), thwarts the business model altogether due to its prohibitive cost. At best, it inserts an intermediary that can appropriate market power. The combination of embedded crypto-assets and governance by decentralized consensus allows a network to work for the benefit of its users, i.e., consumers, as opposed to that of the operator of a central platform business with significant control over both users' data and the rules of the game.

Overview of key themes

We have identified nine themes that will shape the development of crypto-asset capital markets (see Figure 1). Inevitably, there are many other areas of potential interest, including broader issues on technology and expansion of financial services ecosystems.

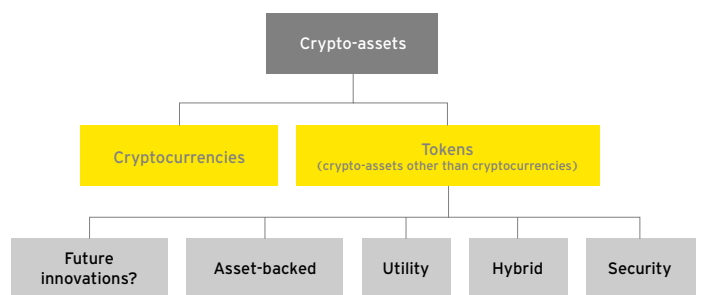
Figure 1: Summary of key themes



Source: EY analysis

An introduction to crypto-assets

Figure 2: Basic taxonomy of crypto-assets



Source: EY analysis.

EY recently published a paper entitled *IFRS (#) Accounting for crypto-assets*,⁷ which explores the nature of various crypto-assets and classifies them based on their underlying characteristics. The basic taxonomy is designed to demystify crypto-assets and present a consistent terminology, as shown in Figure 2.

We use the term “cryptocurrencies” specifically to mean crypto-assets that constitute a peer-to-peer alternative to government-issued fiat currency; a general-purpose medium of exchange independent of any central bank. By contrast, we describe tokens as those designed to support a more narrowly defined, specific use case of DLT.

Of the different types of tokens being developed in the market, some are issued in a token sale or ICO whilst others represent off-chain assets. This report focuses on tokens that an organization issues to investors and analyzes the different stages of capital markets that may affect this activity. Although some of the stages (issuance, listing and trading on exchanges, and investment) may apply to other types of tokens, our analysis in this paper applies to the four listed below, and primarily the first two:

⁷ IFRS (#) Accounting for crypto assets, EY.

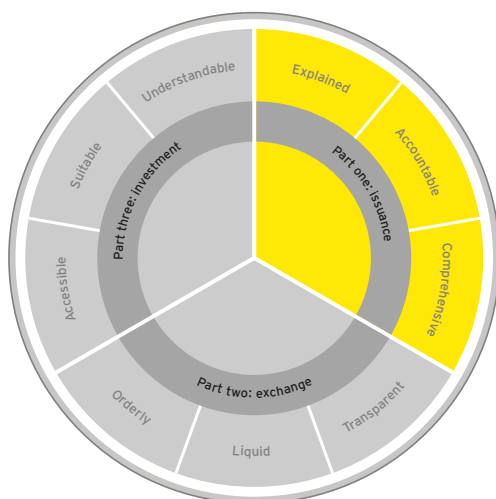
- ▶ **Utility tokens.** This type of token can be offered by the investor in exchange for some type of resource. After the ICO, with the funds raised, the company will carry out the project it undertook prior to the ICO. Once the project is complete, the investors can exchange the tokens for the resource (e.g., hard drive storage space). The value of the token, therefore, is derived from the use of the token within the miniature economy set up by the organization.
- ▶ **Security tokens.** This type of token is akin to a digitized stock, whereby the investor that purchases the token becomes a shareholder of the entity from which they purchased the token. The investor may be entitled to dividends based on the company's profit or have voting rights over the company's strategic direction. The token is a tradable asset, similar to any other type of security, its value being derived from the issuing company's worth.
- ▶ **Hybrids.** It is crucial to note that security tokens and utility tokens represent two ends of a continuum, rather than a binary choice. Ongoing innovation in the crypto-asset space continues to produce hybrid tokens that are part utility token and part security token. These characteristics may even evolve over time, and future regulation must be flexible enough to account for this.
- ▶ **Asset-backed tokens.** A distributed ledger can be used as a platform for maintaining a distributed record of any kind of data. Physical or financial assets, such as gold or stocks, can be "tokenized," i.e., recorded as a token on a distributed ledger. The aim of this tokenization is to streamline trading through immediate settlement of transactions and elimination of reconciliation processes.

Section 1

Primary markets: token issuance

Background

ICOs emerged as a fund-raising tool in the second half of 2014. Three years later, rapid growth ensued, and ICOs surpassed VC as a funding source for DLT projects.⁸ While the sudden emergence of this new phenomenon has highlighted opportunities in this space, it has also highlighted some key challenges.



⁸ Calculated as c.US\$7.5b, surpassing the c.US\$2.5b of equity financing raised by distributed ledger technology companies. Data taken from #Crypto Utopia - The \$20 billion Cambrian explosion of tokenized digital assets, and the emerging infrastructure being built to support them, Autonomous NEXT, Lex Sokolin and Matt Low.

Entity	Opportunities	Challenges
Issuer	<ul style="list-style-type: none"> ▶ Enablement of new business models ▶ Quick access to funds ▶ Minimal administrative burden ▶ Disintermediation of financial services: <ul style="list-style-type: none"> ▶ Low cost (avoidance of most professional fees) ▶ Cases where firms cannot raise funds from conventional VCs 	<ul style="list-style-type: none"> ▶ High failure rate (46% in 2017)⁹ ▶ Reputational risk: <ul style="list-style-type: none"> ▶ Association with failed or fraudulent ICOs ▶ Perception of lower issuer quality (versus IPO or VC) ▶ Noncompliance with laws and regulations: <ul style="list-style-type: none"> ▶ Risk of financial penalties and business disruption ▶ Various regulators claiming jurisdiction over token sales
Investor	<ul style="list-style-type: none"> ▶ Diversification or lack of correlation with many traditional asset classes ▶ Disintermediation of financial services: <ul style="list-style-type: none"> ▶ Access to early stage investments (without accreditation) ▶ No “2/20” management and performance fees ▶ Community membership 	<ul style="list-style-type: none"> ▶ High investment risk (market/default): <ul style="list-style-type: none"> ▶ Associated with early stage investments ▶ Lack of understanding of technology and token economics ▶ Possibility that investors may not understand or be prepared to bear it; suitability issue ▶ Technological risks or cybersecurity (e.g., the DAO hack)¹⁰ ▶ Risk of mis-selling or fraud: <ul style="list-style-type: none"> ▶ Adequacy and review of disclosures (whitepaper) ▶ Particularly in the utility-type ICO (no claim on issuer)

The term “ICO” evokes the concept of an IPO of a company’s shares on a stock exchange. However, the tokens issued in an ICO may or may not be securities, depending on the underlying economic relationships involved.

Indeed, it is crucial to understand that many ICO token issuances differ in a number of ways from conventional securities issuances, including introducing new concepts relating to smart contracts and the bearer nature of assets created.

The U.S. Securities Exchange Commission (SEC) communicated concerns on the topic of ICOs, notably through its report of investigation regarding the DAO.¹¹ Given the global nature of

the ICO market, the SEC’s regulatory stance has been of key interest to market participants even beyond the US, particularly regarding the definition of the term “security.” However, the root of this definition, known as the Howey Test,¹² exposes the fundamental differences between the US and European legal systems, and the resulting need to make a unique and separate determination from a European perspective.

Scope of key regulations

In the European Union, a range of regulations are relevant to the topic. We have focused our analysis on the updated Markets in Financial Instruments Directive¹³ (MiFID II) and requirements for the preparation of prospectuses (the Prospectus Regulation¹⁴ or PR).

9 46% of Last Year’s ICOs Have Failed Already, Bitcoin website (accessed via <https://news.bitcoin.com/46-last-years-icos-failed-already/>, 1 October 2018).
 10 Understanding The DAO Attack, CoinDesk, 27 June 2016 (accessed via <https://www.coindesk.com/understanding-dao-hack-journalists/>, 1 October 2018).
 11 Report of Investigation Pursuant to Section 21 (a) of the Securities Exchange Act of 1934: The DAO, The U.S. Securities and Exchange Commission, 25 July 2017 (accessed via <https://www.sec.gov/litigation/investreport/34-81207.pdf>, 31 October 2018).

12 No. 843 Securities and Exchange Commission v. W. J. Howey CO., 1946 (accessed via <https://caselaw.findlaw.com/us-supreme-court/328/293.html>, 1 October 2018). The Howey Test is used to determine whether an instrument qualifies as an “investment contract” for the purposes of the Securities Act of 1933.
 13 The updated Markets in Financial Instruments Directive (No. 2014/65/EU, MiFID II).
 14 Prospectus Directive Regulation (No. 809/2004/EC), as subsequently updated and replaced by the PR (No. 1129/2017/EU).

MiFID II applies to activities involving financial instruments, including those it defines as “transferable securities.” This term, referred to by the PR simply as “securities,” means “those classes of securities which are negotiable on the capital market, with the exception of instruments of payment, such as (a) shares in companies and other securities equivalent to shares in companies, partnerships or other entities, and depositary receipts in respect of shares; (b) bonds; and (c) any other securities giving the right to acquire or sell any such transferable securities or giving rise to a cash settlement determined by reference to transferable securities, currencies, interest rates or yields, commodities or other indices or measures.” One should note that, under MiFID II, physically settled commodity derivatives constitute financial instruments, but not transferable securities. Moreover, the definition of a security relies on reference to capital markets – itself not a precisely defined term.

If a token gives the holder rights to receive cash flows resulting from some form of economic activity, it would therefore appear to meet the definition of a (transferable) security under EU law.

The situation is not as clear for utility tokens. On one hand, these constitute limited-purpose media of exchange and could therefore be considered “instruments of payment” under the above definition (i.e., they would explicitly be excluded from the definition of transferable securities). On the other hand, regulators may choose to consider utility tokens to be “other securities equivalent to shares in companies, partnerships or other entities.” However, the argument for such equivalence appears likely to be strained in many circumstances due to the very different substance of the underlying economic relationships involved.

In our view, there are two distinct categories of token issuance from a regulatory perspective: tokens that constitute securities and those that do not.

Basic PR requirements and exemptions

Under the PR, the requirement for preparation of a prospectus varies depending on the type of (transferable) securities offered and certain parameters of the offer. Issuers should be aware that it is the offer that triggers the basic requirement to prepare a prospectus, and that offer need not involve an admission to trading on any particular type of trading or execution venue.

The obligation to publish a prospectus does not apply to, for example:

- ▶ An offer of securities to the public with a total consideration in the EU of less than €1m over a 12-month period (although we note the ability of individual Member States to increase this limit to €8m)
- ▶ An offer of securities addressed solely to qualified investors¹⁵
- ▶ An offer of securities addressed to fewer than 150 natural or legal persons per Member State, other than qualified investors
- ▶ An offer of securities addressed to investors that acquire securities for a total consideration of at least €100,000 per investor, for each separate offer
- ▶ Securities offered, allotted or to be allotted to existing or former directors or employees by their employer or by an affiliated undertaking, provided that a document is made available containing information on the number and nature of the securities and reasons for and details of the offer or allotment

Rules that apply to the ICO market

The average ICO size in 2017 was c.€15.8m globally and c.€13.9m in Europe,¹⁶ though such simple averages tend to be skewed by a small number of extremely large issuances. We note a “trimmed mean” of c.€6.7m,¹⁷ which is also in line with an overall mean below €5m in the less exuberant 2014-16 period. This indicates that the typical ICO warrants attention as a true SME funding tool and that many security ICOs are likely to constitute sub threshold issuances in certain jurisdictions, such as the UK.

¹⁵ Glossary, Financial Conduct Authority (accessed via <https://www.handbook.fca.org.uk/handbook/glossary/G1817.html>, 6 November 2018).

¹⁶ *Initial Coin Offerings Funding Report 2017*, Funderbeam, 2017 (accessed via www.funderbe.am/icoreport, 7 January 2019).

¹⁷ *Next Generation Financing Models: Using Tokens to raise capital*, EY Global Blockchain Summit, 2017.

It is also normal for ICOs to include both a private and a public sale, where the former may be multiple times larger than the latter. Provided that the private sale is conducted in such a way as to constitute a true exempt offering based on the abovementioned conditions (e.g., if it is offered to qualified investors only), it is realistic to issue tokens for a combined overall consideration in excess of €30m¹⁸ in certain EU jurisdictions without triggering the PR provisions.

We do not interpret this as an enticement for ICO issuers to avoid meaningful disclosure that would enable token buyers to adequately assess the risks and potential rewards of investing in a particular ICO. Rather, we see examples such as the approach by the UK Financial Conduct Authority (FCA) to subthreshold offers or the EU's creation of the EU Growth Prospectus as a counterweight to the perception that regulation is necessarily onerous, which we frequently observe among members of the crypto community.

Exemption for nonprofit bodies

It is worth noting that the PR makes an exemption from the requirement to produce a prospectus. It explicitly exempts issuers of those *"securities issued by associations with legal status or non-profit-making bodies, recognized by a [EU] Member State, for the purposes of obtaining the funding necessary to achieve their non-profit-making objectives."* We are aware of a number of ICOs structured so that tokens are issued by a charitable foundation. However, the governance of such entities is not always clear and may not be consistent with bona fide nonprofit-making objectives.

We would strongly encourage any potential issuer to obtain specialized professional advice before attempting to structure an ICO relying on this exemption.

Adequate disclosure

In general, the lack of a legal requirement to produce a prospectus under the PR, according to the conditions above, should not be construed as a green light to avoid meaningful disclosure that would enable token buyers to adequately assess the risks and potential rewards of investing in a particular ICO. Indeed, Member States may impose reasonable requirements on offers that would be exempt under the PR, as exemplified by crowdfunding (notably that conducted under the UK's FCA oversight), which we explore later in this section of the report.

¹⁸ EY analysis.

Prospectus versus whitepapers - analysis and overview

We have reflected on common practices used in whitepapers for ICO issuers and compared these with our experience on typical prospectus content for technology companies. In analyzing the structure and content of both, we have identified the most common attributes of each, and reviewed mandatory PR disclosures to see if and how these have been applied in whitepaper publications within the ICO market.

Content

Prospectuses and whitepapers are most similar in their broad types of content about the company and industry in which it operates. In a prospectus, company ownership is explicitly stated, along with long-term management strategy and regulation applicable to its operations. Typically, there is considerable detail on market conditions under which the company operates, giving an investor the overall context of its business. Whitepapers for ICO issuers also detail the market and industry; however, this tends to be more focused on the specifics of crypto-assets and the technologies used within the business model. This is an area where whitepaper detail varies widely - those with more information often give the reader a broader sense of how the company's vision for development fits within the wider blockchain ecosystem: for example, if the company is contributing to industry groups or is active in the development of a particular protocol.

Another key aspect of the content relates to information on the share or token to be issued. In a prospectus, the net assets expected after issuance are disclosed, as well as the amounts the company expects to receive. The company details future plans for spending the funds received and any conditions attached to the share issue. Whitepapers include information on the token sale; in fact, this is often one of the more prominent sections in an ICO whitepaper. This typically would involve a description of the token and sale process whereby investors can make a purchase. Sometimes, details are also included about the company's anti-money laundering (AML) and know-your-customer (KYC) procedures (this is not explicitly included in a

prospectus). In the absence of certainty around how ICO issuers are regulated, some are making an effort both to carry out best-practice AML/KYC procedures and to disclose them to their investors.

Both prospectuses and whitepapers focus heavily on their primary investor audience. Prospectuses aim to bring more clarity around the investment opportunity by profiling a typical investor. This information helps individuals compare themselves with someone the company may be targeting for investment. Some whitepapers include user scenarios, describing situations where individuals may be interested in investing in their token. This is arguably even more relevant for an ICO whitepaper, where the importance of building a community around the company's vision and goals is considered paramount for the success of the ICO.

Seeking investment from the public is by nature a forward-looking event: the company is asking for money based on its future strategy and business plans. Therefore, it is not surprising that many statements about the future are included in both a prospectus and a whitepaper. Prospectuses contain a section on forward-looking statements, detailing unknowns and risks involved with the potential investment. This is followed by a warning to investors that they should not rely on such statements and a disclaimer by the company from the obligation to update the prospectus after any changes in circumstances, except where required by law. There are whitepapers that also include a warning about forward-looking statements; however, this is by no means a widespread practice in the industry.

Structure

A prospectus as a document has prescriptive rules which contrasts with the situation for whitepapers. One commonality for prospectuses is the appearance of warnings and risk identifiers to investors early on in the document. For example, page 1 of a prospectus may contain a statement of the directors' acceptance of responsibility for all the information

and risk factors for investors to consider before investing in the company. While whitepapers often disclose risks and regulatory considerations for the ICO, these are not normally stated at the beginning of the document. As with all whitepaper content, there are diverse levels of detail on risks; some provide no information on this topic.

The PR dictates that a summary of disclosure requirements appear up front in a prospectus. This includes a warning to investors about investing in securities, key financial information, investment objectives and strategy, classes of securities, and information on the share capital of the company, risks, proceeds and expenses of the share issue, use of proceeds and any lockup agreements.

Whitepapers tend not to include a summary table similar to the above; however, some whitepapers have a brief executive summary. Whitepapers may also be structured differently; sometimes companies will issue a summary whitepaper of a few pages and a longer, more detailed technical whitepaper. A prospectus summary is arguably one of the largest contributors to reader understanding of a prospectus and is something to be encouraged in the ICO market as a standardized practice.

Key differences

Although various elements mentioned above are common to prospectuses and whitepapers, our research shows some differences in content, structure and presentation. First, the risk disclosures in whitepapers are fewer in number and less detailed than those in prospectuses. However, prospectuses are required to disclose warnings to investors on their suitability for investment in the company, as well as a wider range of risks to different stakeholders, including risks to the company, advisors

or third parties and to the shares themselves. Therefore, even though some whitepapers include a risk warning for investors, the scope is typically not broad enough to consider risks for other stakeholders as well. An additional warning often appearing in whitepapers is a statement regarding applicable legal and regulatory rules, which are constantly being updated or changed. Many jurisdictions have not formalized specific rules for ICOs. Therefore, companies may warn investors that such matters are ongoing, and changes in circumstances may affect the future functionality of tokens or their platform. This is important for investors because it involves an extremely high level of risk for their capital.

Prospectuses for companies undertaking a share issuance will contain a working capital disclosure to state that the company has enough working capital for the next 12 months, after taking into account the net cash proceeds of the issuance. This section will also include actions to take if the expected amount of proceeds is not raised, with a potential supplementary document and working capital statement based on those revised net proceeds.¹⁹

The statement of working capital and information about a company's funds and financials is one of the areas frequently lacking in an ICO whitepaper. There is often little information about the company's current level of funds and their provenance. A prospectus typically will include historical financial statements as an appendix, whether audited or unaudited. Since this is not a practice adopted in the ICO industry thus far, there is a much lower level of transparency around the financial health of the relevant company. This makes the decision on whether to invest based less on the current state of the company's affairs and more on future plans for platform development.

¹⁹ NEX Exchange Growth Market - Rules for Issuers, NEX Exchange, 2017.

The platform, protocol or product to be built by the ICO issuing company is often described in detail in the whitepaper. This is one of the key elements, along with the listing exchanges, quality of leadership team and endorsements, that will drive adoption of the company's offering, and affect the future price of the token investment. The technical architecture to be used, details of specific consensus mechanisms and functionality provided appear in the whitepaper, yet are completely absent from any IPO prospectus. In this way, whitepapers are more technology-focused and provide a greater level of detail about the inner workings of the company from a technology perspective. It could be argued this is more necessary for ICO offerings than other traditional offerings, since investors are less familiar with the technology. However, investors in ICO tokens are commonly more involved in the ICO and crypto industries, and potentially more familiar with these technologies. It would be beneficial for the market to move toward a level of disclosure about technological specifications that applies across whitepapers, emphasizing intelligibility for investors, no matter how technical their backgrounds.

Stages of development

The analysis above shows that while prospectuses and whitepapers are similar in many ways, they differ in their disclosures. One primary reason is that companies undertaking an IPO are usually at a much later stage than those issuing tokens in an ICO. ICO issuers are commonly early stage; some have never received seed funding and are still in an idea or minimum viable product (MVP) stage. It may be more appropriate to compare an ICO whitepaper with a "pitch deck" presentation for an early stage start-up. This often will include much less historical financial information than in a prospectus and more detail about the product and technology, as opposed to the risks involved in investment. It is usually assumed that VCs or other early stage investors will be well aware of such risks.

Key insights and themes

As a result of the analysis above and the associated financial services regulations, we have identified these key insights and themes relating to token issuance in primary markets.

1. Explained

Investors need to receive clear explanations to understand the risks and opportunities involved in any investment. A full prospectus provides a wide range of information suitable for investors to make investment decisions. However, as both the PR itself and examples of prospectuses are readily available for readers to review, we have particularly focused our analysis on instances where this is not required and have identified insights from these situations.

Insight from MTF admission documents

In addition to direct regulation of issuer disclosure, the PR gives Member States the right to set rules allowing multilateral trading facility (MTF) operators to determine the content of the admission document that an issuer is required to produce upon the initial admission of its securities to trading. To the extent that crypto-asset exchanges become authorized as regulated entities within a jurisdiction, this may ultimately constitute the key avenue through which best practices are implemented.

Existing examples of such practice include the requirements imposed by:

- ▶ The London Stock Exchange's Alternative Investment Market (AIM) in the UK and Italy - to prepare an "admission document"²⁰
- ▶ Nasdaq First North in the Nordic countries - to prepare a "company description"²¹
- ▶ Euronext Access and Euronext Growth in continental Europe - to prepare an "information document"²²

MTFs make it possible for entities to offer securities to the public with no minimum issuance threshold and are subject to more streamlined disclosure requirements and other regulation compared with listing on a regulated market. We consider the

relevance of such requirements to the whitepapers prepared by ICO issuers in the prospectus contents section below and the possibility of crypto-asset exchanges becoming authorized as MTFs in Part 2.

Insight from the proposed regulation to harmonize crowdfunding rules (ECSPR)

Crowdfunding is another relevant source of insight. In recognition of the currently fragmented nature of crowdfunding regulation across the EU, and in line with the ongoing Capital Markets Union (CMU) action plan, the EC has proposed regulation that would harmonize crowdfunding rules.²³ In the accompanying impact assessment, the EC noted the potential to include ICOs at some point in the future.²⁴

In relation to security ICOs, it should be noted that the ECSPR currently could only apply to issuances below the €1m threshold imposed by the PR, as the exemption of larger issuances of up to €8m is at Member States' discretion and therefore is not uniform across the EU. While this would likely limit the new regime's usefulness for security ICOs, we note the potential for further development of the PR and ECSPR, particularly in relation to utility-type ICOs. Moreover, the ECSPR's disclosure requirements, i.e., the contents of the Key Investor Information Sheet (KIIS),²³ could serve as an inspiration for subthreshold security token issuances under national regimes, especially for issuances of utility tokens.

Insight from regulation of advertising practices

The PR (Article 22) predominantly regulates advertisements relating to offers of securities to the public where the issuer is subject to the obligation to produce a prospectus. However, one key provision always applies: if material information is disclosed to a selected investor, such information must be disclosed to all other investors to which the offer is addressed. ICO issuers should be aware of this requirement in the context of the separate presentations they often conduct for investors in private sales.

²⁰ Admission and Disclosure Standards, London Stock Exchange Group (accessed via <https://www.londonstockexchange.com/specialist-issuers/covered-warrants/how-to-issue/listingandadmission/listingandadmission.htm>, 2 October 2018).

²¹ Guide to listing on Nasdaq First North, First North (accessed via <https://business.nasdaq.com/>, 1 October 2018).

²² Euronext Access Rule Book, Euronext Brussels (accessed via <https://www.euronext.com/regulation/euronext-access>, 2 October 2018).

²³ COM (2018), 113 final, Proposal for a Regulation of the European Parliament and of the Council on European Crowdfunding Service Providers (ECSP) for Business, European Commission, 2018.

²⁴ SWD (2018), 56, Impact Assessment Accompanying the Proposal for a Regulation of the European Parliament and of the Council on European Crowdfunding Service Providers (ECSP) for Business, European Commission, 2018.

Insights from the UK's FCA regulatory approach to crowdfunding

The UK's FCA does not impose specific rules on the form or content of disclosures by issuers using loan-based or investment-based crowdfunding. Instead, it sets out the overarching principle that firms must ensure *"that investors have the information they need to be able to make informed investment decisions and that all communications are fair, clear and not misleading."*²⁵ Further guidance states that disclosures must be accurate, balanced and understandable in order to comply.²⁶ Firms are required to consider the nature and risks of the investment, and provide appropriate, useful information without overburdening investors with detail. Prominent risk warnings are required, but not considered to provide sufficient protection in and of themselves.

Based on observations from the crowdfunding market, the UK's FCA has expressed concerns about the lack of balance between benefits and risks leading to overly optimistic impressions of particular investments. It has also noted the difficulty faced by retail investors in assessing the value of non-readily realizable investments without access to reliable due diligence information. This emphasizes that the risk of capital loss is exacerbated if the price paid for a security is based on an overvaluation of the issuing business.

In light of practices we have observed in the market, ICO issuers should be particularly aware of the need to keep risk disclosures specific and to include information about the assumptions made in setting the ICO price.

The UK's FCA specifies the type of investor to which offers of non-readily realizable securities can be directed. Ordinary retail clients that do not obtain (regulated) investment advice may only be targeted if they either self-certify as "sophisticated investors" in accordance with COBS 4.12.8R or certify, through the Restricted Investor Statement under COBS 4.7.10R, that they will not invest more than 10% of their net investible financial assets in unlisted equity and debt securities.

For issuers, use of the sophisticated investor statement should not be construed as a simple check-box requirement; the UK's FCA specifies that *"firms should carry out the assessment with due skill, care and diligence, having regard to the general nature of the investments and the level of experience, knowledge and expertise the retail client being assessed must possess in order to be fairly and reasonably assessed and certified as a sophisticated investor."*²⁵ The assessment must be carried out by a third party, i.e., independently of the issuer or promoter of the security.

It appears, therefore, that the most prudent course of action for ICO issuers, when approaching retail investors, would be to make use of the Restricted Investor Statement (RIS). This may be a reasonable precaution even for issuers of utility-type tokens. Ultimately, this regime may prove restricting, given that the RIS imposes a maximum percentage of net assets that an investor can invest in a particular type of asset. We note that tokens would fall in the same category as crowdfunding investments, for example, for the purposes of this threshold.

The UK's FCA rules are media-neutral, i.e., intended to apply to all firms marketing securities in the UK, through the internet or other media. However, the abovementioned marketing restrictions and, to an even greater extent, the application of the MiFID II appropriateness test in relation to investors as "clients" ultimately highlight the fact that the UK's FCA crowdfunding rules are mostly directed at the activities of crowdfunding platforms (i.e., regulated investment firms that facilitate investments by individuals). This introduces a parallel to those crypto-asset "exchanges" and other entities that offer token issuance platforms and related services, which we discuss further in Part 2.

²⁵ FCA Policy Statement PS14/4, *The FCA's regulatory approach to crowdfunding over the internet, and the promotion of non-readily realisable securities by other media*, Financial Conduct Authority, 2014.

²⁶ FCA Feedback Statement FS16/13, *Interim feedback to the call for input to the post-implementation review of the FCA's crowdfunding rules*, Financial Conduct Authority, 2016.

2. Accountable

Those involved in the ICO should be accountable for the quality of the issuance and associated disclosures. Interests of those investing in an ICO, or issuing or promoting it, can be aligned in a number of ways. Underwriting the issuance may be a model worth exploring, and the EU's new SME growth market concept provides interesting insights.

Insight on the underwritten ICO

In Article 5, the PR sets out the possibility for a resale of securities. This does not fundamentally change the conditions that trigger the requirement to prepare a prospectus, but points to the possibility of an ICO conducted in two stages: first, a private sale to qualified investors, including at least one acting as an underwriter; and second, public sale of tokens by the underwriter. We understand that some ICO issuers have contemplated such an arrangement. Certain potential benefits might include:

- ▶ Improved accountability, through direct balance sheet exposure, of firms engaged to promote ICOs
- ▶ Increased certainty of proceeds for issuers
- ▶ Migration of compliance expertise from the issuer level to specialized (and, to the extent that they underwrite security ICOs, regulated) entities, leading to cost savings or compliance risk reduction, or both, for issuers

An underwritten ICO carried out in this manner could fall below the threshold that triggers the PR's prospectus requirements. If it does not, PR (Article 15(1) (d)) still allows a reseller of securities to make use of the EU Growth Prospectus, subject to certain conditions that are likely to be met, even for large ICOs.

Insight on the EU Growth Prospectus and (large) ICOs

Through the PR, the EU has created a new, intermediate step between an MTF and a full regulated market, known as an SME growth market. To date, AIM and Euronext Growth, respectively, have applied and announced their intention to apply for registration under this new regime. A related

concept, the EU Growth Prospectus, allows larger offerings of securities to the public without the requirement to prepare a full prospectus. Although it introduces the requirement of approval by the competent authority in the relevant Member State, this "proportionate disclosure regime" could prove highly attractive to issuers of large ICOs, due to the combination of start-up friendliness and theoretically unlimited issuance size.

In accordance with PR Article 15, the EU Growth Prospectus can be relied on by any of the following:

- a) SMEs, defined as entities that meet at least two of the following three criteria:
 - ▶ Fewer than 250 employees, on average, during the previous financial year
 - ▶ A balance sheet of not more than €43m
 - ▶ Annual net revenue of not more than €50m
- b) Issuers other than SMEs with an average market capitalization of less than €500m over the previous three years, provided that their securities are traded or will be traded on an SME growth market
- c) Issuers other than the above, where:
 - ▶ The offer of securities to the public does not exceed a total in the EU of €20m over a 12-month period
 - ▶ The issuer has no securities admitted to trading on an MTF
 - ▶ The issuer has fewer than 499 employees, on average, during the previous financial year
- d) Offerors of securities issued by issuers referred to in (a) and (b) above

Due to the typically early stage of their businesses, the developer entities behind ICO issuances generally would fall under (a), allowing the completion of large ICOs subject only to the proportionate disclosure regime, with no requirement to list on an SME growth market or other type of MTF. More established issuers, including those that have completed a previous successful ICO and subsequently proceed to sell down their token reserves, may find themselves constrained by either the size threshold in (c) or the listing requirement in (b).

Insight on distance marketing

ICO issuers should note that The Directive on the Distance Marketing of Financial Services (DMD)²⁷ imposes additional requirements for withdrawal rights, regardless of any of the PR's issuance thresholds. The UK's FCA notes the existence of this right, referencing the DMD, in crowdfunding contracts.²⁶ While there is no right to cancel distance contracts for investments whose price depends on fluctuations in the financial market that are outside the issuer's control, we note that many tokens are not activated by the issuer for a period of time after they are sold, during which they do not trade. Moreover, the UK's FCA has stated that *"where a secondary market exists in name only but does not work in practice - that is, if no trades take place and the investment does not fluctuate in value - we question whether the criteria are met for the business model to be exempt from the requirement to offer cancellation rights."*²⁵ We see this as having clear implications for ICOs, given that (i) some issuers could argue, for example, that the Ethereum blockchain constitutes a secondary market, and (ii) tokens often exhibit limited liquidity shortly after issuance whether or not they are listed on some form of exchange.

Finally, we note that even utility-type ICOs, being nonfinancial contracts under current regulations, would be subject to the Consumer Rights Directive,²⁸ which includes a similar right of withdrawal to that under the DMD. So the requirement to grant a 14-day cooling-off period would appear difficult to avoid for many, and possibly most, ICOs, regardless of their type.

3. Comprehensive

Investors need a wide range of information to inform their decisions in evaluating an ICO. We propose some examples to help identify how this is managed without creating excessive complexity.

Insight on required disclosures

Where no prospectus is required, MTF operators typically specify a set of required disclosures to be included in an admission document. For example, an admission document may be based on PDR

Annexes I-III, with some permitted exclusions and certain additions mandated by the MTF operator.

Even where some form of prospectus is required, we note that PR Article 18 allows the competent authority of the home Member State to authorize the omission of certain information from the prospectus, subject to specific conditions. Examples of particular relevance to ICO issuance include situations where the information in question is of minor importance or inappropriate to the sphere of activity or legal form of the issuer or the securities. In the latter scenario, the omitted information must be replaced with information equivalent to that required, unless no such information exists.

²⁷ Directive No. 2002/65/EC, *The Directive on the Distance Marketing of Financial Services*, The European Parliament and the Council of the European Union, 2002.

²⁸ Directive No. 2011/83/EU, *The Consumer Rights Directive*, The European Parliament and the Council of the European Union, 2011.

Certain exclusions from the PDR annexes that we would advise ICO issuers against applying include:

PDR exclusion	Reason to avoid exclusion
Annex I, Section 11	Any serious ICO issuer will specify details of historical and future R&D in its whitepaper.
Annex I, Section 13	For a utility token, forecasts should arguably be required to illustrate the token value trajectory and identify (and test sensitivity to) key valuation assumptions adopted in pricing the ICO. This would constitute a modification in line with PR Article 18.
Annex I, Section 14	It may be sensible to require compliance with this section in full, as key management personnel tend to be critical determinants of the success of ICO projects. Section 14.2, which relates to the disclosure of conflicts of interest, could be seen as a crucial tool in combating public perceptions of market manipulation and other unethical conduct in the crypto-asset capital markets.
Annex I, Section 15	Disclosure of the details of remuneration arrangements with key personnel, advisors and promoters would provide useful context to investors for communications by these parties about an offering.
Annex III, Section 5	Regulators may wish to specify, as a best practice, that ICO issuers prepare separate terms and conditions (T&Cs), given that, especially for utility-type ICOs, this forms a cornerstone of the relationship between issuer and token buyer.

Conversely, we encourage ICO issuers to apply one rule applied by certain trading venue operators but not included within EU regulations. This requires an issuer that has not been independent and earning revenue for at least two years to ensure that all related parties and applicable employees at the date of admission agree not to dispose of any interest in securities for one year from admission. Such a requirement could help align the interests of (persons connected with) the issuer with those of token buyers and would serve to discourage ICOs conducted purely for the issuer's short-term gain.

Insight on amendments to the whitepaper and the right of withdrawal

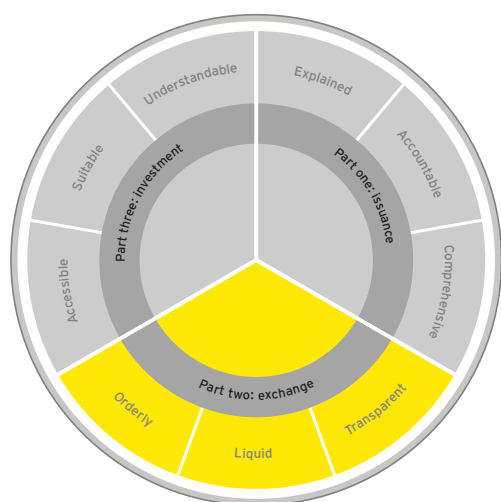
ICO issuers frequently update their whitepapers prior to the final closing of their offer. In the context of the PR (Article 23), this actually constitutes a requirement, to the extent that inaccuracies are noted or significant new factors emerge that relate to the information included. Moreover, the PR establishes the investor's right to withdraw their agreement to purchase the securities where a prospectus is supplemented and requires any such supplement to state this right prominently.

We argue that this should be thought of as fair practice, even where a prospectus is not required.

Section 2

Secondary markets: crypto-asset exchanges Background

Crypto-asset market participants engage in secondary market activities such as buying or selling interests to achieve their financial objectives. Crypto-asset exchanges have arisen in a number of forms to support these transactions.



Exchanges serve as marketplaces where commodities, securities, derivatives and other financial instruments can be traded. The core functions of a marketplace include provision of a venue for orderly trading and the efficient dissemination of information related to the market for the assets in question.

A wide range of types of exchanges have emerged to serve the crypto-asset sector, offering a variety of services and operating models.

These exchanges exhibit varying forms of centralization or decentralization, in some ways mirroring the concepts that have underpinned crypto-assets, which we explore further in this section.

The word “exchange,” however, can fail to convey the scope of some of these entities’ activities. Exchanges provide a variety of products and services beyond simple order book-based trading. For example, some crypto-asset exchanges serve as “wallets,” providing a storage facility for the assets. This creates an additional parallel with other types of financial institutions, such as banks or depositaries, and raises a further range of topics for consideration, such as rights and responsibilities relating to these assets.

Crypto-asset exchanges tend to be classified as either centralized or decentralized. However, in reality, this is a spectrum along which firms are categorized according to a number of dimensions;

in particular, with reference proposed by Vitalik Buterin (co-founder of Ethereum) in relation to blockchain software. We note:

- ▶ Architectural centralization (the number of computers in the system and their redundancy)
- ▶ Political centralization (the number of entities controlling the system)
- ▶ Logical centralization (how unified or “monolithic” the system is)

We explore these concepts further within “Deep dive: centralized versus decentralized exchanges in practice” later in this report. We also review a range of topics relating to crypto-asset exchanges and consider insights from more traditional exchanges that may be applicable for the crypto-asset industry.

Scope of key regulations

Although commonly used, the term “exchange” is broad and lacks formal regulatory or legal definition. Even more so than in Part 1 of this report, MiFID II is the main regulatory focus of our analysis. A range of key concepts underpin the area commonly referred to as “exchanges.” In particular, a “trading venue” is a foundational element for this analysis and can take one of a number of forms within MiFID II: a regulated market, MTF or an organized trading facility (OTF).

There are important distinctions between these types of trading venue; however, in both a regulated market and an MTF, we can identify characteristics relevant to the current analysis. These are multilateral systems, operated by an investment firm or a market operator, that bring together multiple third-party buying and selling interests in financial instruments. They provide both a trading system and a set of nondiscretionary rules. Taken together, these elements provide a venue in which binding contracts are agreed between the buying and selling interests.

The third-party buying and selling interests referred to above create the conditions for an active market. However, financial regulators also recognize that the competing interests of these

multiple parties can create incentives that may cause them to engage in behavior that would undermine long-term trust and the credibility of the market. Therefore, under MiFID II, regulated markets and the participants operating within them are subject to a plethora of rules governing the venues and constraining the conduct of market participants.

For institutions that provide a wallet or stored-value facility for crypto-asset or fiat currency balances, the scope may be extended to a wider range of regulations as discussed below. At one end of the regulatory spectrum, holding customer deposits is an activity that can only be performed by credit institutions, as determined under the Capital Requirements Directive IV (CRD IV)²⁹ and the Capital Requirements Regulation (CRR)³⁰. A challenge to the analysis of these rules in the context of the crypto-asset market is that the term “deposit” is not defined under the CRD IV and the CRR, although certain Member States set out their own definition.

Other regulations covering services related to customer funds and payments include the Electronic Money Directive³¹ (EMD), which covers the provision of e-wallets for fiat currency, provisions relating to client assets within MiFID, and provisions made at a Member State level relating to holding client assets (e.g., the UK’s FCA Client Assets Sourcebook).³²

Rules on the context of the crypto-asset exchange market

Many crypto-asset exchanges currently operate in Europe outside the scope of financial services regulation, particularly where they do not deal in fiat currency. Indeed, this is the case where none of the assets trading on the exchange is a financial instrument, which surprises some market commentators. In a modern economic system, there are many forms of electronic market for nonfinancial assets that are unregulated but subject to commercial laws and consumer protection. The increased prevalence of electronic marketplaces as a business model may give cause for wider consideration of appropriate market structures and regulatory supervision that have been explored elsewhere.³³

²⁹ Directive No. 2013/36/EU, *Capital Requirements Directive IV*, The European Parliament and the Council of the European Union, 2013.

³⁰ Directive No. 575/2013, *Capital Requirements Regulations*, The European Parliament and the Council of the European Union, 2013.

³¹ Directive 2009/110/EC, originally 2000/46/EC, *The Electronic Money Directive*, The European Parliament and the Council of the European Union, 2009.

³² *Client Assets Sourcebook*, Financial Conduct Authority (accessed via <https://www.handbook.fca.org.uk/handbook/CASS/>, 1 October 2018).

³³ *Cryptocurrencies and why policy makers will need to adopt ‘cross-sector thinking’*, EY, 2018 (accessed via <https://www.ey.com/Publication/vwLUAssets/EY-Policy-Pulse-June-2018-Cryptocurrencies-policy-makers-cross-sector-thinking/%24File/EY-Policy-Pulse-June-2018-Cryptocurrencies-policy-makers-cross-sector-thinking.pdf>, 1 October 2018).

However, we note that if a crypto-asset exchange lists one security token, it would fall within the regulatory perimeter.

In addition to supporting trades in crypto-assets, many exchanges provide a storage facility or wallet. As noted above, institutions that hold cash on behalf of customers may be classified as credit institutions and regulated under the CRD IV or the CRR if these balances are classified as deposits (CRD IV Article 9). Credit institutions face a range of capital, liquidity and wider regulatory requirements concerning conduct and governance, which typically is considered to be a high bar for financial intuitions to comply with. These reflect, in particular, the need to protect a business model that, in simplified form, offers depositors a safe place for their money, while lending this money to third parties to generate revenue. Therefore, to the extent that crypto-asset exchanges are involved in transactions involving the use of assets in customer wallets, for example, lending or trading them, it is arguable that a regulation similar to that applied to a credit institution may be appropriate.

Analogies can also be drawn between the activities of crypto-asset exchanges and e-money institutions, which are regulated under the EMD. Indeed, a number of crypto-asset exchanges are already regulated e-money institutions (EMIs) due to their activities holding fiat currency in electronic wallets. Funds held in a wallet under the EMD are held in segregated accounts with an authorized credit institution, with very stringent restrictions on how these funds can be used (e.g., the EMI cannot lend them out or pay interest on the balances). It is arguable that, in some ways, these regulations provide a template for crypto-asset exchanges; however, there is no direct analogy for being able to store funds with a credit institution.

A number of Member States make provision for a range of firms to handle client assets, even when those firms are not primarily involved in a financial services activity. For example, the UK's FCA Client Assets Sourcebook (CASS) allows a range of organizations to handle client monies and other assets if done strictly in accordance with a set of procedures.³²

These cover matters such as careful segregation and reconciliation of client asset funds, along with other matters such as training of staff throughout the organization on the responsibility that comes with handling client assets. Again, these regulations provide a strong foundation on which either future regulation or the voluntary operating practices of crypto-asset exchanges can be based.

Finally, looking more broadly, there are various regulatory models in place in relation to the provision of services for holding valuables, such as safety deposit boxes. These typically focus on anti-money laundering provisions, such as performing customer due diligence, monitoring procedures and reporting suspicious activity to law enforcement authorities. These regulations offer a sensible minimum framework for crypto-asset exchanges; indeed, we are aware of a number of firms applying these types of procedure.

There are, therefore, analogies with a range of financial services regulations but no clear fit with any one regulation, as they were not drawn up with crypto-asset exchanges in mind.

Centralized versus decentralized exchanges in practice

There are a number of dimensions to centralization, hence the classification of an exchange as either centralized or decentralized is approximate, and often focuses on the issue of control (i.e., political centralization). For example, if an exchange is operated by a single entity and all participants use that entity's platform for storing funds and directing the use of those funds, that entity has political control and can make unilateral decisions. However, if an exchange does not hold client assets or funds but acts more like a means of communication between independent traders who retain control of their wallets, there is less unified control.

While some exchanges are decentralized, with users retaining control of their own funds, there is still a platform (and the rules governing it) that is designed by one person or team. For example, Paradex was designed to include an order book system suited to experienced traders with the intention of providing better prices. The approach also included restricting the range of interactions that can be done on the Ox protocol platform on which Paradex runs. Ox is engineered by a team with its own design philosophy, and the same can be said for each exchange. The power to determine the governance of an exchange is still limited to a group of people, and users will have to choose the service that best suits them before entering the market. For both the user and the regulator, examining an exchange's design and the credibility of the designers is paramount to ensure that, for example, smart contracts or other exchange mechanisms are not used to intercept or compromise transactions, or that price manipulation by the designers does not occur.

As public interest in crypto-assets has grown, crypto-asset exchanges have sprung up to facilitate the exchange of both existing fiat currency holdings for crypto-assets, and crypto-assets recorded on a particular distributed ledger for those recorded on another.

Centralized exchanges have been instrumental in enabling widespread access to crypto-assets, due to their ease of use and liquidity. However, decentralized exchanges are emerging as a more recent phenomenon in reaction to the shortcomings of (e.g., inability to handle too many assets), and ideological controversy surrounding, centralized exchanges. Some members of the crypto community have long argued that the principle of decentralization is crucial to the disruptive nature of DLT.

Below, we consider some practical examples of the design and operation of each type of crypto-asset exchange, highlighting their respective benefits and drawbacks.

Centralized crypto-asset exchanges

Centralized exchanges enable the trading of fiat to cryptocurrency (and vice versa), as well as trades between different crypto-assets. A centralized crypto-asset exchange typically provides services through a customer account, which may be capable of holding not only crypto-assets but also fiat currency (e.g., in an e-money account).

A number of centralized exchanges have built trading tools, such as analytical dashboards and the ability to automatically place trades, which are similar to capabilities available in traditional capital markets. However, customers typically interact directly with the exchange, as they would via a share trading platform or a broker, rather than directly with a traditional exchange. Moreover, the counterparty to each trade may not be obvious - i.e., it may be unclear whether the customer is trading with another customer via netting of trades taking place on the exchange, or with the exchange itself (or a related entity thereof) dealing on its own account.

This ease of access to trade on many centralized exchanges, rich functionality, high volatility and the prospect of high returns has attracted traders to enter the crypto-asset market.

We are aware of some centralized crypto-asset exchanges that claim they do not hold any crypto-assets on their own account, but instead only hold private keys for clients and act in a capacity similar to that of a depository. In such a model, transaction fees would be taken in a fiat currency from fiat money balances deposited by clients at the same crypto-asset exchange. Clients' crypto-assets may be held in a single, commingled wallet (e.g., a single Bitcoin or Ethereum address), but with record-keeping on ownership of these assets held by the exchange. Additionally, a number of platforms offer customers the ability to trade contracts for difference (CFDs); however, these activities are regulated under MiFID and outside the scope of this section of the report.

Another pattern we are aware of is one in which the centralized crypto-asset exchange holds crypto-assets on its own account and takes fees and commissions, i.e., typically transaction commissions, from its clients in the form of crypto-assets. It may be difficult to distinguish between the assets of the exchange and those of its clients, and even more so among those of different clients. As noted in the prior example, the crypto-asset exchange will typically combine all client assets into one wallet, and may or may not hold its own crypto-assets in a separate wallet. Practices vary, and may include a combination of directly maintaining custody of crypto-assets (in both hot and cold wallets) and holding balances deposited at other crypto-asset exchanges. In any event, when the clients of a single centralized crypto-asset exchange transact among themselves, and possibly even with the crypto-asset exchange, there may be no on-chain movement of crypto-assets between addresses. The crypto-asset exchange simply rearranges its own off-chain ledgers, similar to the process undertaken by a bank processing a payment between two of its depositors. If the crypto-asset exchange takes both fiat and crypto-asset deposits, it may never be clear to the client whether they are transacting with another client of the crypto-asset exchange or with the crypto-asset exchange itself. That is, the crypto-asset exchange can match orders and act in a dealer capacity.

Example of centralized exchange

1. Maker places an order to trade either directly (e.g., sell one BTC for £5,500) or uses the exchange software to make more complex trades, such as limit orders, which the exchange executes automatically when conditions are met.
2. Exchange posts the order to the public order book.
3. Taker searches the order book and accepts a price, or the pre-set buying instructions will be executed automatically by the exchange when conditions are met.
4. The transaction is completed on the exchange's system; funds are exchanged instantly between the two traders without going through a blockchain.



Note that the trade is performed quickly on the exchange's own platform, not processed on a blockchain. A single user is not necessarily matched with another, but the exchange software matches the user's trade with the best options (within defined parameters) in the liquidity pool.

When users decide to withdraw their tokens or spend them somewhere other than on that particular exchange, they must transfer the funds to a wallet, which will require an on-chain transaction.

Decentralized exchanges

Decentralized exchanges are not controlled from start to finish by a single entity, such as an authorized market operator. Instead, they are run on a distributed ledger, similar to the underlying crypto-assets. They do not hold customer funds, positions or information, and only serve as a matching and routing layer for trade orders, i.e., a broker-type role. Decentralized exchanges function as peer-to-peer exchanges, whereby transactions are completed based on smart contracts. Trades occur directly between users (peer to peer) through an

automated process. The supposedly “trustless” nature of these exchanges means that there is less trust needed in the security of the exchange itself, since the funds are held by an individual in their personal wallet and not by a third party. This system contrasts with the alternative centralized model in which users typically deposit their funds into an account with the exchange.

As well as offering the ability to trade less widely supported tokens, a major reason decentralized exchanges exist is that while many traditional centralized crypto-asset exchanges store private keys for users on central servers, these constitute a single point of failure susceptible to attacks. Decentralized exchanges mitigate such security risks by not storing any coins or private keys on central servers, and instead transfer responsibility to the customer for ensuring the safe-keeping of their own private keys. It should be noted that decentralized exchanges facilitate the trading of one crypto-asset with another, but typically lack functionality for fiat currency conversion.

Decentralized exchanges come in a variety of forms, with the earliest established to facilitate basic bitcoin trading. A notable variation on a decentralized exchange service is LocalBitcoins, which provides support for peer-to-peer trading, including presentation information by buyers and sellers. There is no central dealer or system that handles funds and transfers, though an escrow service is used to hold the seller’s bitcoins until the trade completes. This model is one of the only forms of decentralized exchange that can operate with fiat currency. Also, due to the peer-to-peer nature of matching, this can also be described as a method for facilitating an OTC market, where dealers trade with one another through communication channels such as telephone, email and electronic trading systems.

Another type of decentralized exchange is the Ethereum Virtual Machine (EVM) smart contract-driven market. This is a hybrid of sorts, restricted to tokens conforming to the ERC20 standard (or its intended replacement, ERC223), i.e., tokens built on top of the EVM (though not the original ether itself, which is older

than the standard - it must be converted or “wrapped,” to bring it into line with the ERC20 standard, before it can be traded in this way). These tokens can work with smart contracts on the EVM, such as through the EtherDelta exchange, allowing a buyer and seller to be matched and funds to be transferred between them via an undisputed code-based contract. This prevents a person holding only a non-ERC20 type of coin (e.g., bitcoin) or fiat currency from participating in this kind of exchange because those assets are not compatible with EVM smart contracts.

Another type of decentralized exchange that is open to a broader set of payment methods, including fiat currency, is the decentralized version of the more common centralized exchanges such as GDAX or Binance. Examples include Bitshares, or a new decentralized exchange being created by Binance itself. These will offer buyer-seller matching and leave them to complete the trade, with the user having a local wallet rather than funds being held by the exchange. This provides a lot of freedom and removes the exchange as a single point of failure, so is seen to be superior for many crypto purists. However, there are other potential security risks, including the reversing of fiat transactions or the lack of fallback in case something goes wrong. There are options to have someone appointed to arbitrate a dispute, but that adds costs and complexity and reduces anonymity. Trading times are longer on this type of exchange because one has to wait for the payment to clear (i.e., be mined or bank transferred) rather than having the whole transaction happen instantly on the exchange’s internal system; therefore, this is unattractive for rapid or high-volume traders.

Example of decentralized exchange

1. Maker sends an exact order price to the Relayer (e.g., sell 1.1 GNO for 200 BAT); involves no complex trades such as limit orders.
2. Relayer (similar in function to a miner) acts as a matching service, and posts the order to the public order book.
3. Taker searches the order book and accepts a trade.
4. Taker digitally signs and completes the order, filling in the smart contract and transaction processes on the blockchain.



Relayers act as brokers, facilitating a transaction by posting the order to the order book and being paid for completed transactions. Order books are off-chain, which makes them faster and places no pressure on the blockchain. The transaction is completed on-chain only after orders are matched. In Paradex, for example, brokers use the Ox protocol, rather than a decentralized exchange. Ox allows free direct trades between people who have arranged it without the use of a Relayer; however, if a Relayer is used, it is paid in native ZRX tokens.

This is not the same in all exchanges. For example, on the Kyber Network DEX, everything happens on-chain, not just the final recording of the token transfer. No order books are involved, but buyers and sellers access a common fund pool and can generate income on the spread. No other matching process is needed and transactions are recorded permanently on the blockchain.

Atomic swaps are an important concept in decentralized exchanges, allowing direct conversion from one crypto-asset to another, even between blockchains. It is a mechanism by which transactions can be completed directly and instantaneously between two different blockchains in an attempt to avoid fraud due to the irreversible nature of the transactions.

A smart contract known as a Hash Time-Locked Contract (HTLC) is exchanged between the two parties, which enforces complete simultaneous swapping of the two crypto-assets if both agree within a certain timescale. Neither party is at an advantage over the other, nor is any intermediary required beyond the smart contract itself. This can be performed on an exchange or directly between two people who have communicated outside of an exchange.

Key insights and themes

As a result of the analysis above, we have identified these key insights and themes relating to crypto-asset exchanges in secondary markets.

1. Transparent

The operating principles of the exchange and the activities it is involved in should be transparent.

The operating principles and parameters of an exchange, along with capital and liquidity pools available to be accessed via that exchange, may be attractive to issuers and investors. These dynamics are also of particular interest to regulatory authorities responsible for supervision.

MiFID II requires *“that investment firms and market operators operating an MTF or an OTF provide the competent authority with a detailed description of the functioning of the MTF or OTF, including, without prejudice to Article 20(1), (4) and (5), any links to or participation by a regulated market, an MTF, an OTF or a systematic internaliser owned by the same investment firm or market operator, and a list of their members, participants and/or users”* (MiFID II article 18.10).³⁴

Insight on transparency of fees

Few crypto-asset exchanges provide such clear and public information about listing fees. Some exchanges specify on their application forms that listing fees will be negotiated in the application process. MiFID II requires the regulated market to ensure that its fee structures (including execution fees, ancillary fees and any rebates) are transparent, fair and nondiscriminatory and do not create incentives to place, modify or cancel orders or to execute transactions in a way that contributes to disorderly trading conditions or market abuse (MiFID II article 18.10). This clarity helps give users confidence in their choice of exchange.

Insight on conflicts of interest

The breadth of activities undertaken by firms operating exchanges can result in actual or perceived conflicts of interest, which can lead customers to question whether a firm has their best interests at heart. In order to address this, MiFID II requires that *“investment firms and market operators operating an MTF or an OTF have arrangements to identify clearly and manage the potential adverse consequences for the operation of the MTF or OTF, or for the members or participants and users, of any conflict of interest between the interest of the MTF, the OTF, their owners or the investment firm or market operator operating the MTF or OTF and the sound functioning of the MTF or OTF”* (MiFID II Article 18.4).³⁴ This is particularly pertinent where crypto-asset exchanges have the right to use the crypto deposits for proprietary trading.

Moreover, to manage potential conflicts of interest, MiFID II does not allow investment firms or market operators operating an MTF to execute client orders against proprietary capital, or to engage in matched principal trading (MiFID II article 19.5).³⁴

If a centralized crypto-asset exchange can determine how orders are matched, or whether clients deal with each other or the exchange as a dealer, there is a potential conflict of interest between the exchange and the client in relation to any particular trades and whether they are the best available. The exchange needs to manage this carefully. Potential conflicts also arise relating to proprietary trading by centralized exchanges, whether authorized or unauthorized. We have seen little to no evidence of contractual restrictions placed on crypto-asset exchanges' ability to use clients' deposited crypto-assets for their own proprietary trading. We are not aware of such practices being widespread, but the apparent lack of safeguards, or at least disclosure, could be seen as a concern. A third-party custodian could serve as a key part of the relevant control structure if proprietary trading were to be prohibited by contract or regulation.

³⁴ Directive 2014/65/EU, *Markets in financial instruments*, The European Parliament and the Council of the European Union, 2014.

2. Liquid

The market should be liquid, with a healthy volume of bids and offers, creating conditions for low spreads and low volatility. Liquid markets are attractive to both buyers and sellers, as they increase confidence that transactions and strategies will be able to be executed efficiently and effectively. A number of conditions contribute to the development of liquid markets.

Insight on market makers

Market makers are market participants that offer to buy or sell at a certain price, namely the price shown on an exchange, which supports liquidity of a market. They exist under the rules designed and created by the exchange and are approved by the relevant regulator. MiFID II identifies the need for written agreement with firms pursuing this strategy and also more broadly requires regulated marketplaces to ensure *“that a sufficient number of investment firms participate in such agreements which require them to post firm quotes at competitive prices with the result of providing liquidity to the market on a regular and predictable basis where such a requirement is appropriate to the nature and scale of the trading on that regulated market”* (Article 48.2).³⁴ Formalizing the role of market makers and using them to ensure the market is liquid would appear to be an interesting model for some crypto-asset exchanges to pursue, particularly decentralized exchanges.

Insight on crypto-asset derivatives

Derivatives play an essential role in liquid markets by allowing market participants, including market makers that are direct providers of liquidity, to hedge their positions. MiFID II includes commodity derivatives in its definition of financial instruments. This implies that cash-settled contracts are within MiFID II scope, as are physically settled contracts on regulated markets and MTFs or OTFs. Therefore, although many crypto-assets are not currently regulated as financial instruments, crypto-asset derivatives are capable of being financial instruments under MiFID II.

In the UK, the FCA has stated that any entity arranging transactions or advising on crypto-asset futures, contracts for differences, and options, requires authorization by the FCA. If the exchange matches orders in at least one crypto-asset that has the attributes of a financial instrument, the exchange should be considered a trading venue under MiFID II.

At the time of writing, no pure-play crypto-asset exchange is considered a regulated trading venue in the EU to our knowledge; however, we understand that some firms are considering seeking this status to gain credibility with potential institutional investors.

Such derivatives would include, according to analysis by the FCA:³⁵

- ▶ **Cryptocurrency futures:** a derivative contract in which each party agrees to exchange cryptocurrency at a future date and at an agreed price
- ▶ **Cryptocurrency contracts for differences (CFDs):** a tradable contract between a client and a broker who are exchanging the difference in the current value of a cryptocurrency and its value at the contract's end
- ▶ **Cryptocurrency options:** a contract that grants the beneficiary the right to acquire or dispose of cryptocurrencies

For its part, the European Securities and Markets Authority (ESMA), which coordinates standards across Member States, is assessing how MiFID II might apply to digital assets. In line with its broader review of retail investors' access to derivatives, ESMA has proposed restrictions on derivatives tied to virtual currencies for retail investors. Therefore, participants in the crypto-asset market should monitor proposals from ESMA.

³⁵ FCA statement on the requirement for firms offering cryptocurrency derivatives to be authorised, Financial Conduct Authority, 2018 (accessed via <https://www.fca.org.uk/news/statements/cryptocurrency-derivatives>, 1 October 2018).

3. Orderly

Trading on exchanges should offer fairness, reliability and efficient operations. Regulators seek to promote orderly trading and set requirements for trading venue operators. If a market is considered disorderly, investors are likely to lack the confidence to participate. Therefore, it is desirable both for market participants and for the long-term value of the trading venue operator that this is maintained.

Insight on price formation

At a most basic level, MiFID II requires that MTFs and OTFs *“have at least three materially active members or users, each having the opportunity to interact with all the others in respect to price formation.”* (Article 18.7)³⁴ This forms a very basic premise of an active market.

Insight on broad rules covering MTF entities

MTF entities are subjected to a range of broad and far-reaching rules regarding their operations. To manage the risks to which they are exposed, they are required to *“have effective arrangements to facilitate the efficient and timely finalization of the transactions executed under its systems; and to have available, at the time of authorization and on an ongoing basis, sufficient financial resources to facilitate its orderly functioning, having regard to the nature and extent of the transactions concluded on the market and the range and degree of the risks to which it is exposed.”* (Article 19)³⁴

In addition, they are required to *“establish transparent rules and procedures for fair and orderly trading and establish objective criteria for the efficient execution of orders”* and *“have arrangements for the sound management of the technical operations of the facility, including the establishment of effective contingency arrangements to cope with risks of systems disruption.”* (Article 18.1)³⁴

Finally, *“the investment firm [i.e. the MTF] shall monitor the transactions in order to identify infringements of those rules, disorderly trading conditions or conduct that may involve market abuse and that is to be reported to the competent authority.”* (Article 18.5)³⁴

These are broad and general requirements; however, regulated firms are required to put frameworks in place to satisfy regulators that these risks have been adequately addressed and understood. We note that this could prove very problematic in the case of decentralized exchanges - not only organizationally but also crucially in terms of enforceability.

Insight on disorderly trading

MiFID II has specific provisions relating to disorderly trading. In particular, there are requirements on firms to monitor orders, including cancellations to identify infringements of rules, disorderly trading conditions, prohibited activities and system disruptions. They are required to *“deploy the resource necessary to ensure that such monitoring is effective.”* (Article 31)³⁴ These provisions would appear to provide a logical basis for supporting orderly trading in crypto-assets, although some specific considerations are required, such as how to reverse (or amend) a transaction made on a blockchain ledger.

Insight on systems resilience

Specific references are made within MiFID II to requirements for systems resilience. Again, these are broad and put the burden upon firms to design appropriate systems and procedures to satisfy regulators (as well as customers). They include having sufficient capacity to deal with peak order and message volumes, and testing to meet business continuity requirements (Article 48.1).³⁴

These requirements are of particular significance, given performance issues experienced by a number of crypto-asset exchanges, especially during 2017. Therefore, crypto-asset operators may wish to explore approaches taken by regulated trading venues to meet these requirements.

Insight on sudden price movements

MiFID II requires a *“regulated market to be able to temporarily halt or constrain trading if there is a significant price movement in a financial instrument on that market or a related market during a short period and, in exceptional cases, to be able to cancel, vary or correct any transaction.”* (Article 48.5)³⁴

In light of the high volatility experienced in crypto-asset markets, these matters merit careful consideration. While the nascence of these markets may lead participants to expect a certain degree of volatility, we draw attention to a more fundamental challenge: in the specific context of decentralized exchanges, trading halts or constraints may even be impossible to implement.

Insight on algorithmic trading by market participants

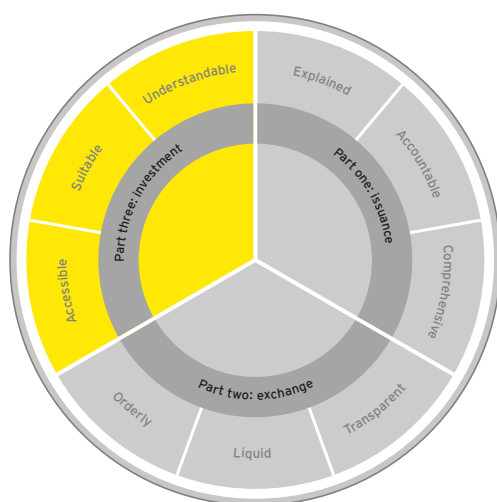
MiFID II addresses the topic of algorithmic trading specifically. It requires market participants to carry out *“appropriate testing of algorithms and providing environments to facilitate such testing, to ensure that algorithmic trading systems cannot create or contribute to disorderly trading conditions on the market and to manage any disorderly trading conditions which do arise from such algorithmic trading systems, including systems to limit the ratio of unexecuted orders to transactions that may be entered into the system by a member or participant, to be able to slow down the flow of orders if there is a risk of its system capacity being reached and to limit and enforce the minimum tick size that may be executed on the market.”* (Article 48.6)³⁴

The risk of malfunctioning algorithmic trading systems is a threat to all markets. Therefore, participants in crypto-asset capital markets may wish to consider how they test these appropriately to ensure they do not cause significant market disruption.

Section 3

Investors and collective investment schemes

In this section, we distinguish between direct investment and indirect investment. The key regulatory aspects of the former have been covered in Part 1 and Part 2 through our discussion of ICOs and the deposit-taking function of crypto-asset exchanges. In Part 3, we will focus on the latter, i.e., indirect investment in crypto-assets through various forms of collective investment schemes, and on the robust regime of existing regulation applicable to such funds.



Background

As of September 2018, the total market capitalization of crypto-assets was c.US\$200b.³⁶ Most of these assets continue to be held by retail investors through the mechanisms we have identified as direct investments: 84% of trading volume is accounted for by retail investors compared with, for example, 11% in equities. While the number of crypto funds has grown rapidly to stand at a total of 312, they control only c.US\$7.5b to US\$10b in assets. This range rises to c.US\$14b with the inclusion of traditional financial products, such as the Bitcoin Investment Trust, CoinShares exchange-traded notes (ETNs) or crypto-asset derivatives, but the market remains small in relation to the overall crypto-asset capital markets.³⁷

The increasing professionalism of crypto-asset investing has led to the emergence of a range of strategies similar to those seen in traditional capital markets.

³⁶ <https://coinmarketcap.com/>.

³⁷ #Crypto Utopia - The \$20 billion Cambrian explosion of tokenized digital assets, and the emerging infrastructure being built to support them, Autonomous NEXT, Lex Sokolin and Matt Low.

Such strategies include both active strategies, such as VC-style investing or (algorithmic) trading, and passive strategies, such as indexing. Fund structures range from the abovementioned investment trust to limited partnerships of the type seen in private equity and VC. In some cases, interests in funds may be issued in the form of tokens recorded on a distributed ledger.³⁷

Some traditional financial institutions are expressing interest in crypto-asset trading and investing, such as Andreessen Horowitz with the announcement of a dedicated fund³⁸ and Goldman Sachs with the decision to set up a dedicated trading desk.³⁹ However, significant barriers to institutional adoption remain, notably in the areas of custody and access to orderly trading with sufficient liquidity. Perhaps most notably, institutional interest does not (yet) equate to the presence of the infrastructure that would enable mass retail access to indirect crypto-asset investment. This is despite the ongoing efforts of several US asset managers that have been clamoring for approval of a crypto-asset exchange-traded fund (ETF) for a number of years.³⁷ In relation to such retail infrastructure, we shall see that regulation may constitute a key constraint in the absence of action by regulators, or even policymakers.

Scope of key regulations

In the EU, the regulation of investment management applies to activities (i.e., investment advice and portfolio management) and entities (i.e., investment funds and their managers). The former are defined by MiFID II, which we have noted restricts strict applicability to activities involving financial instruments. By contrast, the regulation of entities may apply regardless of the nature of the assets held. For crypto funds, this translates into far greater clarity than that enjoyed by other key participants in the crypto-asset capital markets.

The most common, mass market funds for retail investors in the EU are known as Undertakings for Collective Investment in Transferable Securities (UCITS) and are regulated by Directive 2009/65/EC and Directive 2014/91/EU (collectively, UCITS V). All other funds, known as alternative investment funds (AIFs),

and their managers (AIFMs) are governed by the Alternative Investment Fund Managers Directive (No. 2011/61/EU; AIFMD). Disclosures relating to these and other investment products sold to retail investors, collectively referred to as packaged retail and insurance-based investment products (PRIIPs), fall within the scope of Regulation (EU) No. 1286/2014 (the PRIIPs Regulation).

Rules on the context of crypto-asset funds

The European crypto-asset funds market is currently at a very early stage of development, particularly in relation to mass market funds. Therefore, the analysis in this section focuses largely on the regulatory possibilities for such a fund, rather than drawing upon practical experience.

From our discussions with market participants, we hear informal evidence of crypto-assets having spurred an interest in investing among younger people, in particular. For example, Revolut, the UK-based digital challenger bank, announced in February 2018 that 100,000 people had unlocked access to trade crypto-assets through their app within the first month.⁴⁰ Therefore, we see a potential opportunity for regulators to nurture this additional interest, perhaps ultimately contributing to public policy objectives such as ensuring adequate savings for retirement and promoting investment in the real economy. However, focus would be needed on the suitability of assets for this purpose. Given that investors' interest in crypto-assets appears to be unwavering, even in the face of some financial institutions' reticence,³⁷ it may be worthwhile for regulators to allow some form of professionally managed, regulated indirect investment. This would likely result in better investor protection when compared with steps restricting access to indirect investment in crypto-assets, which may drive investors toward less diversified, and therefore riskier, direct investments in only a few crypto-assets.

³⁸ Connie Loizos (2018, June 25), *Andreessen Horowitz has a new crypto fund – and its first female general partner is running it with Chris Dixon*, TechCrunch, 25 June 2018 (accessed via <https://techcrunch.com/2018/06/25/andreessen-horowitz-has-a-new-crypto-fund-and-its-first-female-general-partner-is-running-it-with-chris-dixon/?guccounter=1>, 1 October 2018).

³⁹ Hugh Son, Dakin Campbell and Sonali Basak (2017, 21 December), *Goldman is setting up a cryptocurrency trading desk*, Bloomberg, 21 December 2017 (accessed via <https://www.bloomberg.com/news/articles/2017-12-21/goldman-is-said-to-be-building-a-cryptocurrency-trading-desk>, 1 October 2018).

⁴⁰ Official Revolut statement on Twitter (accessed via <https://twitter.com/RevolutApp/status/959014315113304064>, 10 October 2018).

Custody in the context of crypto-assets

One of the key obligations imposed by AIFMD is the requirement (Article 21) for the AIFM to appoint a depositary for each AIF it manages.⁴¹ The depositary must be a credit institution, a firm authorized to provide the ancillary service of safe-keeping and administration of financial instruments for the account of clients, or another category of institution that is subject to prudential regulation and ongoing supervision based on rules set out by its home Member State (note: under UCITS V, the requirements regarding depositaries are not dissimilar).

Under this latter provision, Member States can relax the requirements for depositaries of AIFs that:

- a) Have no redemption rights exercisable during the period of five years from the date of the initial investments
And either:
- b) Generally do not invest in assets that must be held in custody
Or
- c) Generally invest in issuers or non-listed companies in order to potentially acquire control over such companies in accordance with AIFMD Article 26⁴¹

In relation to crypto funds, we note that requirement (b) would only apply to funds that do *not* invest in security tokens, as financial instruments constitute assets that must be held in custody under AIFMD. Requirement (a) could well apply, as a fund that tokenizes its interests and thus gives its investors access to secondary market liquidity need not offer meaningful redemption rights.

Even under the relaxed regime, however, an AIFMD-compliant depositary would have to both (i) be subject to mandatory registration or rules of professional conduct and (ii) *“be able to provide sufficient financial and professional guarantees to enable it to perform effectively the relevant depositary functions and meet the commitments inherent in those functions.”* In light of the specific nature of crypto-assets, we would interpret this provision under paragraph 3(c) of Article 21 as giving rise to the obligation to adopt sound practices in relation to, for example, cold storage of private keys. This is particularly important for utility tokens, which do not constitute financial instruments, as

outlined in Section 1, and therefore are not explicitly covered by the provisions of paragraph 8(a). In order to align with the objectives of paragraph 12, we would encourage crypto AIFMs to demand that depositary contracts, which must be agreed to in writing, impose a liability on the depositary for any loss of crypto-assets entrusted to it.

In relation to crypto-asset exchanges, some of which have made strategic moves into custody services, we would also draw attention to AIFMD Article 21(10),⁴¹ which relates to fair dealing and conflicts of interest. To the extent that a crypto-asset exchange acts as a depositary to an AIF and simultaneously provides market-making services resulting in the receipt of trading commission income, we consider that these activities should be functionally and hierarchically separated in order for the conflict to be appropriately managed. In these circumstances, disclosure to the investors would also likely be warranted.

Similarly, if a depositary (such as a crypto-asset exchange) holds crypto-assets on its own account, we would encourage the AIFM appointing it to demand that the depositary’s crypto-assets be segregated from the AIF’s assets at all times. For example, the depositary should maintain separate blockchain addresses to enforce this segregation and implement controls over the transfer of crypto-assets between addresses under its control. The separation could extend to wallet software, and even hardware. Though it may not clearly constitute an explicit requirement of AIFMD, such an approach would conform to its spirit and reinforce the abovementioned safeguard against conflicts of interest.

Crypto-asset exchanges seeking to provide institutional-grade custody offerings should be aware of these requirements and should engage with regulators to obtain one of the necessary authorizations.

Given the international nature of the crypto-asset capital markets, it would appear most judicious to seek this as an investment firm authorized to provide the ancillary service of safe-keeping and administration.

⁴¹ Directive 2011/61/EU, *Alternative Investment Fund Managers Directive*, The European Parliament and the Council of the European Union, 2011.

Key insights and themes

As a result of the analysis above, we have identified these key insights and themes relating to investors and collective investment schemes.

1. Accessible

To appeal to mass market investors, crypto-asset funds would need to meet certain criteria relating to accessibility. There are a number of well-established regulatory structures to allow mass market participation in funds; however, consideration of these is required in light of the specific characteristics of crypto-assets.

Insight from AIFMD

AIFMD casts a very wide regulatory net, defining AIFs as effectively all collective investment schemes that do not fall within the scope of UCITS V. Its scope is unaffected by the open- or closed-ended nature, legal form or, crucially, the nature of the assets held. AIFs do not face regulatory constraints on the type of assets in which they may invest, and need not invest in any transferable securities or other financial instruments.

AIFMD applies to all AIFMs, except:

- (i) Those managing one or more AIFs with total assets of not more than €100m
- (ii) Those managing one or more AIFs with total assets of not more than €500m, provided that those AIFs are unlevered and have no redemption rights exercisable during a five-year period following the date of initial investment

For subthreshold AIFMs, AIFMD Article 3(3) still applies. This entails registration with the competent authority of the home Member State, certain reporting requirements and the possibility that the Member State may impose additional rules.

For comparison, the overall average assets among crypto funds amount to only c.€28m, rising to an average of c.€375m among the top 10 funds.⁴² Even in light of Autonomous NEXT's claim that a crypto fund with assets of less than c.€22m would struggle for viability in the face of a challenging market,³⁷

this leaves open the possibility of operating crypto funds subject only to national regimes.

Under AIFMD Article 3(4),⁴¹ however, such funds would not enjoy the cross-border marketing rights provided for by AIFMD. Given the international nature of the crypto-asset capital markets and the abovementioned economies of scale in fund management, it would be wise for subthreshold crypto AIFMs to opt into AIFMD, which would then apply to them in full.

Crucially, AIFMD explicitly enables Member States to allow the marketing of AIFs to retail investors. This would lay the regulatory foundation for the mass marketing of crypto funds. However, in such cases, AIFMD simultaneously allows Member States to impose requirements on AIFs and AIFMs in excess of those specifically provided for by AIFMD. While Member States are prevented from using such requirements to advantage AIFs resident in their own territory relative to those resident in other Member States, this provision nevertheless serves to potentially fragment the market, creating complexity for, and imposing additional compliance costs on, crypto AIFMs. In order to combat this fragmentation, in keeping with the vision of the CMU, we would encourage the competent authorities of Member States to consider collaborating on a harmonized regime of retail crypto AIF marketing regulation, which could eventually be included in AIFMD.

Non-EU AIFMs and Brexit

AIFMD applies to AIFMs and AIFs based both inside and outside the EU. Non-EU AIFMs may market EU or non-EU AIFs in the EU, subject to the conditions set out by AIFMD Articles 39 and 40. We draw attention to paragraphs 11 and 17 of the respective articles, which stipulate that, in either case, the non-EU AIFM may not market the AIF in question to retail investors. This appears to apply regardless of any determination made by EU regulators in relation to the equivalence of the regime applicable in the third country. Consequently, depending on the outcome of the Brexit process, UK AIFMs may not be able to rely on AIFMD to market crypto funds to retail investors.

⁴² As of July 2018; #Crypto Utopia - The \$20 billion Cambrian explosion of tokenized digital assets, and the emerging infrastructure being built to support them, Autonomous NEXT, Lex Sokolin and Matt Low.

Insights from UCITS V

UCITS are funds designed to constitute the main collective investment vehicle catering specifically to retail investors, i.e., an equivalent of mutual funds in the US. UCITS V is the latest in a long and successful line of EU regulations that have created a harmonized regime allowing such schemes to be authorized in one Member State and marketed across borders. This means that, while authorization of a fund under the relevant national (rather than EU-wide) regime is possible, such an approach limits the size of the end market, which is problematic in an industry that benefits from significant economies of scale.

UCITS V Article 1 explicitly defines UCITS in relation to investment in transferable securities, as defined by MiFID II, or other liquid financial assets. Article 50 further specifies the types of holdings permissible within UCITS, including certain derivatives and units in other collective investment schemes. This presents significant hurdles to the creation of crypto UCITS.

To the extent that a fund were to invest in security tokens, that definition would not, in itself, appear to preclude its authorization under UCITS V. However, for this to be possible, the trading venues (i.e., crypto-asset exchanges) through which the fund were to invest would have to become authorized as regulated markets or MTFs, as defined by MiFID II and discussed in Part 2.

Moreover, UCITS could not invest directly in utility tokens or cryptocurrencies, as neither of these fit within the categories defined by Article 50. It may be possible to construct compliant UCITS using derivatives with utility tokens or cryptocurrencies as underlyings, but this would require a clarification by regulators that such underlyings could be seen as “currencies” for the purposes of UCITS V. According to our analysis,⁷ such a conceptualization is not inconceivable, as these crypto-assets constitute, respectively, limited and general-purpose media of exchange. However, any such use of derivatives would still be subject to the constraint of sufficient liquidity. That would likely limit the range of underlyings to a small number of established cryptocurrencies with high market capitalizations, such as

bitcoin or ether, as it would be difficult to envisage the immediate availability of liquid derivatives on small issuances of new tokens. Alternatively, UCITS could attempt to make use of derivatives based on a financial index consisting of a wide range of crypto-assets, or even the total market. Even if such derivatives were to be available and liquid, however, this approach would come with the key difficulty of convincing the competent authority authorizing the UCITS that the relevant financial index fulfills the stringent criteria set out by Article 9 of Directive 2007/16/EC and relevant ESMA pronouncements.⁴³

Arguably, the challenges outlined above would likely result in the failure of derivatives-based UCITS to deliver on the promise of crypto-asset capital markets as a means of retail access to investments in high-growth, early stage ventures.

As a partial mitigating factor, one might look to the ability of UCITS to invest in other, non-UCITS collective investment undertakings, i.e., AIFs. Article 55 caps such investments at 30%, in aggregate, of the total assets of the UCITS – still a meaningful exposure. The AIFs in question could even be managed by the same management company, which would create some synergies. However, Article 55’s concentration limits would complicate such a practice, requiring that UCITS invest no more than 10% (or up to 20% based on rules applied at the discretion of individual Member States) of their total assets in a single fund. Furthermore, pursuant to Article 51, the UCITS would have to demonstrate, among other things: (i) that the investee fund is authorized under laws that provide for supervision deemed by the competent authority of the UCITS home Member State to be equivalent to that under EU law; (ii) that the investee fund provides at least half-yearly reports, including appropriate financial statements; and (iii) that the level of protection for unit-holders in the investee fund is equivalent to that provided for unit-holders in a UCITS. The latter stipulation, in particular, constitutes a high hurdle uncommon, though not insurmountable, for AIFs. In summary, we have shown that the path to indirect investment in crypto-assets through UCITS V appears challenging and the end result, at best, imperfect.

⁴³ Commission Directive 2007/16/EC, Implementing Council Directive 85/611/EEC on the coordination of laws, regulations and administrative provisions relating to Undertakings for Collective Investment in Transferable Securities (UCITS) as regards the clarification of certain definitions - This directive was transposed by the Grand-ducal Regulation of 8 February 2008, European Commission, 2007.

2. Suitable

Investments should be suitable for the audience they are designed to address, and some situations require a formal suitability assessment. MiFID II requires that investment firms make suitability assessments for individual portfolio management or for advice regarding financial instruments. Therefore, the investment firms in question typically must obtain detailed information from their clients before providing investment advice or individual portfolio management, in order to address the question of suitability.

Insight on advisory relationships and suitability assessments

An advisor might directly provide investment advice or portfolio management services, as defined by MiFID II, to an investor dealing on their own account. For example, this might involve the advisor helping the client create an Ethereum address and purchase tokens, or doing so on the client's behalf, similar to a separately managed account. In the case of investment advice, this constitutes a regulated activity only if the subject of the advice is a financial instrument. In the case of portfolio management, MiFID II applies as long as the portfolio in question includes at least one financial instrument.

While MiFID II imposes a host of requirements on, amongst other things, the authorization and supervision of investment firms, the most notable in the context of the present discussion relates to the conduct of a full suitability assessment pursuant to Article 25(2).

Given that some tokens are securities, providers of crypto-asset investment advice and portfolio management services at the very least run a risk of falling within the scope of regulation.

If nothing else, that should compel them to develop skills and adopt practices equivalent to those expected of their conventional financial market counterparts. Although it would theoretically be possible, we do not see a reasonable argument to suggest that advice in relation to investment in utility tokens and cryptocurrencies should be subject to different standards from that relating to, for example, security tokens.

Insight on EuVECA, EuSEF and ELTIF

Within the realm of subthreshold AIFs, the Regulation on European Venture Capital Funds⁴⁴ (EuVECA) and the Regulation on European Social Entrepreneurship Funds⁴⁵ (EuSEF) create an accessible framework that allows the cross-border marketing of their respective subject fund types without requiring full AIFMD compliance. Running to just 17 and 21 pages respectively, they impose only a very limited regulatory burden. However, their applicability to crypto funds, compared with that of AIFMD, appears to be limited.

First, EuVECA and EuSEF qualifying funds can only be marketed to investors that are considered to be, or opt to be treated as, professional investors. This effectively means that they cannot be marketed to ordinary retail investors under any circumstances. While the original regulations included a provision requiring the EC to review that possibility, this recently resulted only in an amendment opening the subject funds to investment by high net worth individuals who invest at least €100,000.⁴⁶ Still, this rule in itself would be relatively inconsequential for crypto funds intended to be held by, for example, crypto-focused UCITS, as discussed above.

Furthermore, EuVECA limits the qualifying fund to investments in instruments not yet admitted to trading on a regulated market or MTF. For a crypto fund, this would mean only investing pre-ICO or in tokens not admitted to trading in an authorized venue, which would not necessarily constitute a major constraint. A more complex problem lies in the EuVECA provision that constrains qualifying investments to equity, quasi-equity or debt instruments. Effectively, this requirement would limit a qualifying crypto fund to investments in security tokens, at best. Interestingly, EuSEF includes a further category of qualifying investments not present within EuVECA, known as “*any other type of participation in a qualifying portfolio undertaking*.” Along with the recitals to both regulations, this suggests that investments in tokens may not be inconsistent with the authors' aims. We would call on regulators to revisit the question of whether utility tokens could,

⁴⁴ Regulation (EU) No. 345/2013, EuVECA, The European Parliament and the Council of the European Union, 2013.

⁴⁵ Regulation (EU) No. 346/2013, EuSEF, The European Parliament and the Council of the European Union, 2013.

⁴⁶ *Impact of New EU Rules on Fund Managers*, Cordium, 2008 (accessed via <https://www.cordium.com/insights/impact-of-new-eu-rules-on-fund-managers/>).

for the purposes of EuVECA (and ELTIF, as discussed below), be considered quasi-equity.

In relation to EuSEF, we note that the key constraint would likely come in the form of the definition of qualifying portfolio undertakings. However, we would not be immediately dismissive of the ability of many blockchain projects to meet the definition of “[having] the achievement of measurable, positive social impacts as [their] primary objective,” noting in particular the potential for the principles of decentralization and democratization they are often built on to align closely with the EuSEF criterion of “[employing] a method of production of goods or services that embodies [the undertaking’s] social objective.” Still, as in the case of any regulatory relaxation afforded to nonprofit-making security issuers mentioned in Part 1, we would strongly encourage market participants to obtain professional advice before attempting to structure a crypto fund relying on this interpretation of EuSEF.

Insight on ELTIFs

The Regulation on European Long-Term Investment Funds (ELTIF) is similar to EuVECA and EuSEF in that it sets out requirements for a particular type of AIF. It specifically references the intent to fund long-term investments in the European economy (ELTIF specifies at least 70% must be invested in long-term assets⁴⁷) and includes investment in real assets costing at least €10m. Still, ELTIF allows qualifying funds to invest, even in certain securities traded on MTFs. While ELTIFs this may at first appear to be of limited applicability, as they are inherently designed for long-term assets typically in fields such as infrastructure or housing, we do see the potential for tokens to theoretically be used as a mechanism to fund such projects, therefore consider this to be worthy of consideration.

Like EuVECA (and glossing over the abovementioned real assets), ELTIF only allows investment in equity, quasi-equity and debt. Unlike their EuVECA and EuSEF counterparts, however, ELTIF qualifying funds can be marketed not only throughout the EU but also, crucially, to retail investors. In such cases, ELTIF imposes

requirements on the AIFM to conduct a MiFID II suitability assessment and on the investor to invest at least €10,000, but not more than 10%, of their financial instrument portfolio in one or more ELTIF qualifying funds. In addition, a prospectus and PRIIPs Regulation-compliant key information document must be prepared. Interestingly, although EuVECA and EuSEF do not preclude such a possibility for their respective subject funds, ELTIF explicitly mentions the possibility of interests in qualifying funds being traded on a secondary market.

3. Understandable

While acknowledging that capital may be at risk, investments should be able to be understood by those considering investment. There are a number of key considerations relating to relaying relevant information to investors in an understandable way.

Insight on disclosure to investors

AIFMD Article 23 sets out the disclosures that AIFMs must make to investors in each of the AIFs they manage. In addition, we consider it useful to highlight the fact that ownership interests in an AIF constitute (transferable) securities and therefore also fall within the scope of the PR. The relevant considerations discussed in Part 1 also apply to crypto fund launches. This means that one might contemplate structuring a fund launch as an exempt offer by selling large interests to professional investors, which may include UCITS as outlined above, with only a subthreshold amount offered to the public. However, we would seriously question the reasonableness of attempting to avoid the requirement to prepare a prospectus when marketing a fund to retail investors. We note the potential for certain crypto AIFs to make use of the streamlined EU Growth Prospectus, which we would consider an acceptable minimum standard of disclosure to ensure adequate investor protection. If regulatory coordination among competent authorities were to occur, we would expect this to constitute one of the key discussion topics.

⁴⁷ Regulation (EU) No. 2015/760, ELTIF, The European Parliament and the Council of the European Union, 2013.

Insight from the PRIIPs Regulation

To the extent that interests in an AIF (or, indeed, UCITS) are marketed to retail investors, they constitute packaged retail investment products (PRIIPs) and therefore fall within the scope of the PRIIPs Regulation. The main requirement under this manageable, 23-page regulation is to prepare and make available to the prospective investor a key information document (KID). Crypto funds may draw some inspiration for such disclosures from existing approved KIDs relating to the crypto-based CoinShares ETNs, though we would caution them to appropriately consider the differences between an ETN and a collective investment scheme.

Insight from ETNs - arrangements that do not constitute collective investment schemes

As alluded to above, there are means of providing retail investors with crypto-asset exposure that does not constitute collective investment undertakings of any kind.

ETNs, such as those offered by CoinShares, represent just one prominent example. They are financial instruments, which places them within the scope of the PR and, to the extent that they are offered to retail investors, of the PRIIPs Regulation. ETNs constitute claims on an issuer that undertakes to accept a derivative liability based on the price of one or more crypto-assets. Although the issuer is likely to hold the underlying crypto-assets in order to manage its risk, the ETN's claim is unsecured and therefore subject to credit risk. It has been suggested that this aspect of ETNs has limited their allure to investors in the wake of the global financial crisis.

Firms transmitting orders in ETNs must be aware of the potential requirement to make a limited suitability assessment under MiFID II Article 25(3) and potentially warn the investor in case they consider the investment not to be appropriate for that investor. While an ETN referencing a single crypto-asset may well be deemed noncomplex and therefore exempt from this requirement, similar to a structured deposit, this will not be the case for all ETNs. If, for example, an ETN were to track a basket

of crypto-assets, and in particular, a variable basket, it would likely be considered complex and within the scope of MiFID II Article 25(3). This matters for crypto-assets for the same reasons discussed in relation to derivatives-based UCITS above: namely, that ETNs referencing single, established crypto-assets are not particularly helpful in promoting the role of crypto-asset capital markets as a means of retail access to investments in high-growth, early stage ventures.

Conclusion

In our analysis, we have juxtaposed security tokens and utility tokens, noting that the latter technically do not fall within the scope of existing EU financial market regulations. However, we have observed from our analysis of market practice that many market participants make little or no distinction among the crypto-assets they deal with. Crypto-asset exchanges tend to list different types of crypto-assets side by side. Moreover, the significant differences in quality and length among whitepapers are not necessarily correlated with the nature of the token being offered. This raises questions regarding the extent to which financial market regulatory principles should be adhered to in utility token issuance, exchange and investment. We note that this has been the subject of some debate, with certain crypto-asset proponents arguing for maximum avoidance of regulation, and policymakers and regulators in certain jurisdictions taking the polar opposite view.

So why would regulatory principles on a par with those adhered to for securities be required? Utility tokens provide exposure to the success or failure of a venture undertaken by the issuer, without offering a contractually stated rate of return. In that respect, they are similar to equity instruments. Unlike the vast majority of equity instruments, however, utility tokens do not give the holder any right to directly influence the issuer's governance or actions. A dissatisfied utility token holder has but one option: to sell their tokens. Therefore, there is an incremental risk associated with holding utility tokens issued by an entity as opposed to equity instruments issued by that same entity. In light of that greater risk, it would appear counterintuitive to argue that the level of protection afforded to investors should be lower.

On the other hand, one could argue that EU regulation relatively clearly defines securities and that utility tokens do not meet this definition. Under that view, utility tokens are technological assets integral to the use of a particular network, i.e., fundamentally different from securities. Proponents of such a view would tend to argue that various types of assets, technological or otherwise, can be purchased on the expectation of price appreciation, and

yet there are few calls for meaningful regulation of their markets. This is in spite of the fact that, for example, collectibles, such as baseball cards, Beanie Babies or, for that matter, CryptoKitties, have at times experienced bubbles in which retail investors have made substantial losses. Ultimately, such an assessment may depend on each individual's attitude toward the balance between freedom and protection. We do not seek to address that trade-off here, offering instead a pragmatic view.

We have noted that the EU already adopts a tiered approach to its regulation of investment schemes, credit institutions and trading venues. It also offers a framework for proportionate disclosure by issuers. Certain principles and regulations found therein could either be applied directly or used as a source of inspiration for crypto-asset capital market standards. We therefore envisage that, given the right set of careful policy choices, a crypto-asset capital market could emerge such that investors are protected, while the burden on issuers remains broadly unchanged and regulatory uncertainty is eliminated.

In order to achieve that highly desirable end state and, in doing so, avoid the threat of stifling innovation through heavy-handed regulation, we would invite policymakers and regulators to engage with professional services firms, ICO issuers, crypto-asset exchanges and investors in a process of co-creation. This would likely involve a further comparative analysis of best practices, with the aim of identifying the key disclosures and standards that matter most for utility tokens and cryptocurrencies, on which we have already attempted to shed light in this paper.

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Special thanks to Amanda Green for her contributions to this paper.
Cover photo by Joshua Sortino on Unsplash

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EYG no. 000136-19GbI

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