cryptocurrencies and tokens

ECB FXCG update

September 2018

thinkforward

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Crypto Media coverage is High

Crypto Custodian Secures Insurance from Lloyds

Kingdom Trust, which provides custody services for 30 digital asset investments, has secured insurance for digital assets held on its qualified custody platform through Lloyd's of London.

Profit & Loss, 28.08.2018

Institutionalisation of crypto markets is gaining momentum

The infrastructure of cryptocurrency markets is still very much in its infancy from an institutional point of view, but it has evolved hugely over the past five years, with the focus shifting from pure trading towards settlement and custody issues.

FXWeek, 31.08.2018

Cryptocurrency Will Replace National Currencies by 2030

Times, 04.05.2018

Thai central bank kicks off digital currency project

Thailand's Central bank has kicked off a project with R3 and eight banks on the development of a digital currency (CBDC) for use in domestic wholesale funds transfers

Finextra, 23.08.2018

FCA welcomes firms working on crypto-assets to latest sandbox cohort.

The Financial Conduct Authority's regulatory sandbox continues to gather momentum, with 29 firms - including some working with crypto-assets - getting the go-ahead to join the initiative's fourth cohort

Finextra , 03.08.2018

AGENDA

- **Definition:** Crypto-assets are stored and exchanged electronically without the need for trusted intermediaries
- **Growth** of Crypto-assets market over the last four years
- **Risks and opportunities** are multiples for investors and issuers.
- **Regulation**: Different countries have adopted a variety of approaches to token offerings.
- **Industry effort**: number of community platforms and working groups have emerged.
- **Looking forward**: What happen next ?

Source: Global digital Finance: Taxonomy for Cryptographic Assets

Definition: Crypto-assets are stored and exchanged electronically without the need for trusted intermediaries (1/2)

Tokens are legal instantiations of a share of an asset, a set of permissions, or a set of claims that are held by the bearer or bearers of said token. A token might take a physical from – such as a lottery ticket – or it might be a digital representation of a physical asset (e.g. factional ownership of real estate or of luxury goods such cars or paintings), a set of permissions (e.g. the right for a one-off or perpetual discount for goods/services on an online platform) or a set of claims, (e.g. the electronic representation of a debt contract).

Digital tokens exist within a variety of network forms including the traditional "hub and spoke" architecture in which a central entity maintains token network activity; however, the primary interest of this definition is the particular subset of digital tokens that exists within distributed or decentralized networks popularly referred to as "crypto assets".

Crypto-assets are **digital assets* that users store and exchange electronically in a peer-to-peer way** without the need for trusted intermediaries, and that are enabled by a network of computers running publicly-accessible DLT software, which applies cryptography.

Crypto assets are of interest for their newness and their rapid proliferation. The technology underpinning the creation of most cryptoassets – blockchain technology – was popularized with the publication of the Bitcoin "Whitepaper" in 2009. Within less than a decade, the industry developed from virtually non-existent into a thriving ecosystem comprising more than **1600 cryptoassets**, a total market capitalisation of over 250 billion USD, and total funds raised from investors via the sale of cryptoassets of almost 20 billion USD.

An important advantage of cryptoassets over traditional tokens is the possibility to build specific, automatically-executed management and business logic directly into the decentral token infrastructure via "smart contracts".

A popular example would be a cryptoassets which is automatically sent out to a buyer who has paid its sales price denominated in another cryptoassets. A more innovative example would be an automatically distributed insurance token payout once a specific event has happened (such as a delayed flight).

Source: Global digital Finance: Taxonomy for Cryptographic Assets

Definition: Crypto-assets are stored and exchanged electronically without the need for trusted intermediaries (2/2)

The Global Digital Finance taxonomy provide a common set of labels for crypto-tokens (herein referred to as "cryptoassets" or "tokens"). These labels will help to better position cryptoassets within general global regulatory frameworks more consistently. The taxonomy contains three top-level label categories, which are not necessarily mutually exclusive

		Examples
"Payment Token" Cryptocurrencies	• Tokens whose intrinsic features are designed to serve as a general purpose store of value, **medium of exchange** or **means of payment**, and/or unit of account. Similar to a currency and designed to work as a, frequently referred as a "coin" or "digital money" • Do not require traditional intermediaries for exchange (e.g. banks, PSPs) and production (e.g. Central Banks). Legal status as a currency is controversial	• bitcoin (BTC) • Ripple (XRP)
"Financial Asset Tokens" Digital Tokens	• Designed to work as a **medium of exchange within a limited ecosystem** and to offer additional feature, such as representing **right to access product or service** or **ownership of assets** (e.g. shares, bonds) • Hosted on top of an existing public DLT and typically issued in ICOs (Initial Coin Offerings), a means for fundraising that avoids traditional intermediaries (e.g. VCs, banks, stock exchanges)	• EOS • Tron (TRX) • Tether (USDT)
Consumer Tokens	• Tokens that are inherently consumptive in nature, because their intrinsic features are designed to serve as, or provide access to, a particular set of goods, services or content. • The most well-known example of a Consumer Token is probably Ether, which was marketed, sold, and serves as "fuel" for the Ethereum blockchain.	• Ether • Waves • Bitshares
Central Bank digital currencies (CBDC)	• **Publicly-accessible digital form of fiat currency** issued by the state and w/ legal tender status. Not a crypto-asset. Could enable users to store and exchange value outside banks in regulated way. No real-life examples beyond ideas (e.g. e-krona at the Swedish Central Bank)	

*Digital asset: anything that exists in a binary, electronic format and comes with the right to use. Source: Credit Suisse, "Blockchain 2.0", 2018; Deutsche Bank, "Cryptocurrencies and blockchains", 2017; Banque de France, "The emergence of bitcoin…", 2018; Oliver Wyman report; Internal analysis

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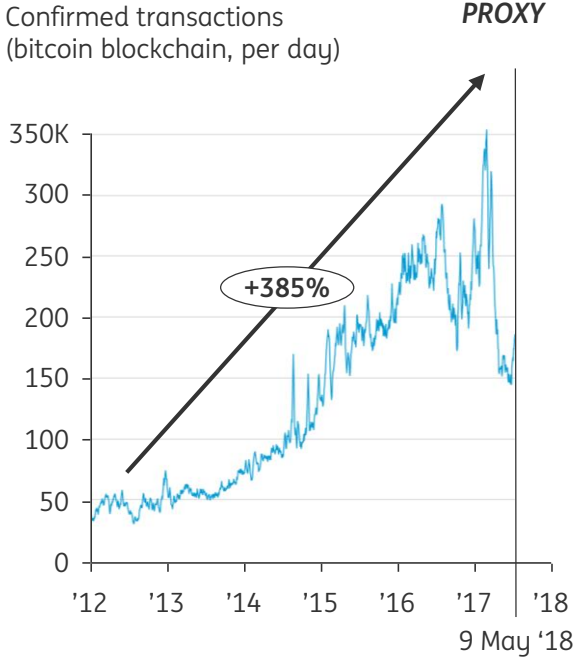
Growth of Crypto-assets market over the last four years

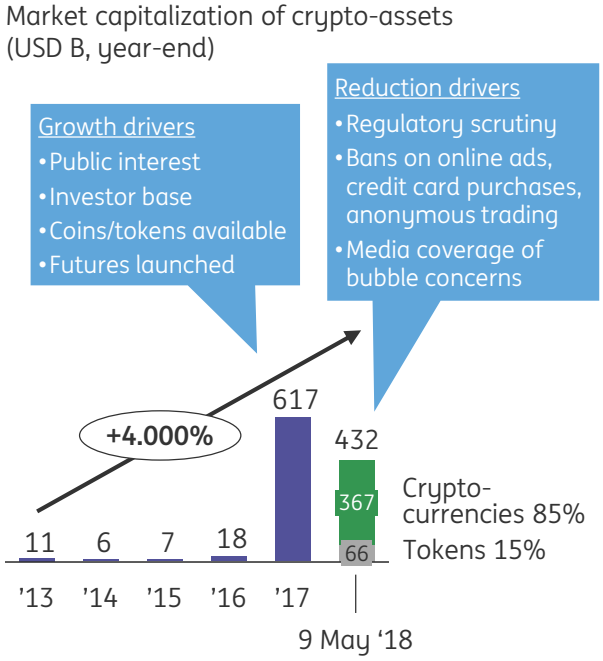
Bitcoin: growth

Confirmed transactions
(bitcoin blockchain, per day)



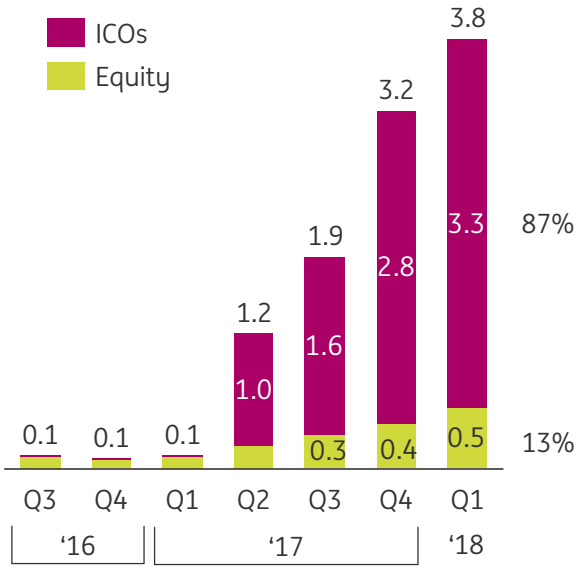
Investments & trading: spike in 2017

Market capitalization of crypto-assets
(USD B, year-end)



Fundraising: ICOs now dominant source for blockchain startups

Total funding of blockchain startups,
by source (USD B)



Source: Coinmarketcap; Blockchain.info; CB Insights, TokenData; Business Insider, Forbes; MyBraadband; BIS; Internal analysis

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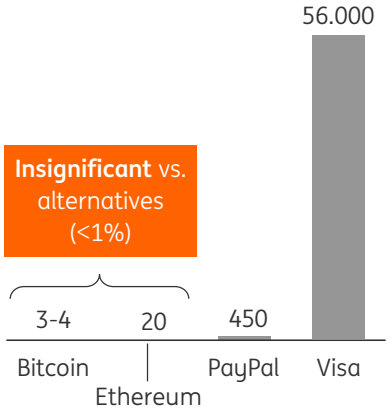
Despite rapid growth, crypto-assets market remains small

Payments

Current maximum capacity (transactions per second)

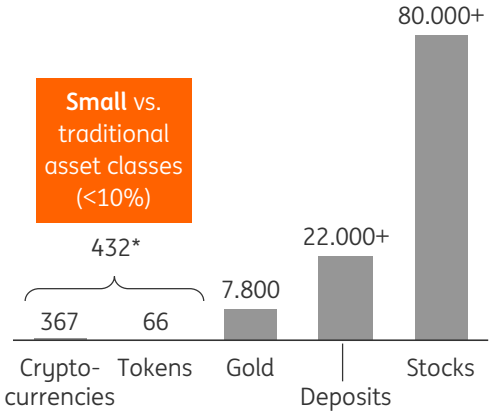


4-year growth in daily transactions (bitcoin network, proxy**; 2017 vs. 2013)

427%

Investments & trading

Current global market value (USD billions)

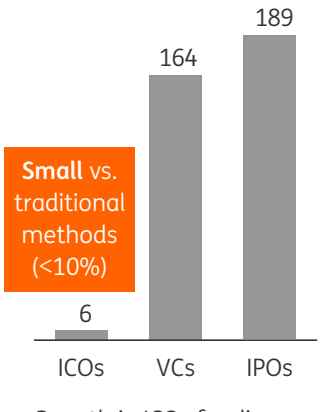


4-year growth in market capitalization (crypto-assets, 9 May '18 vs. YE'13)

+4.000%

Fundraising

Funds raised, 2017 (USD billions)



- Growth in ICOs funding (Q4'17 vs. Q4'16): +**100x**
- ICOs account for **87%** of total funding for blockchain startups (Q1'18)

Conditions for future growth

Market

- Consumers and businesses **adopt** crypto. applications
- **Standardization** in practices of intermediaries

Tech

- **Scalability & cost**: new technologies allow scaling crypto. applications at lower costs than existing alternatives (e.g. payments)
- **Cybersecurity**: vulnerabilities in mgmt. and access to hardware are mitigated, minimizing cyber attacks

Legal

- Central Banks adopt **CBDC or legalize crypto-assets** in unified way globally
- **Crypto. companies** are regulated and supervised
- **KYC/ALM** allow integration of crypto. companies to banking system

*As of May 9th, 2018. **Bitcoin is the most popular crypto-asset, accounting for 37% of the crypto-assets market value.
Source: Coinmarketcap; Blockchain.info; CB Insights; TokenData; Business Insider; Forbes; MyBraadband; BIS; EY; Internal analysis

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Risks and Opportunities

Risks:

Generally, the token markets are nascent and are made up of a number of communities who have different goals and motives. The risks are multiples for investors and issuers. A few of the risks will be;

- Lack of standardisation
- Certain investors may not be sufficiently sophisticated to assess the risks involved
- Consumer protection laws and guidelines need to be clarified for crypto market
- KYS/ALM
- Cyber security
- Risk of market abuse

Opportunity of Cryptoassets

The characteristics of cryptoassets place them in a position to offer significant benefits to society. While far from an exhaustive account of their potential benefits, three characteristics stand out.

1. **They can increase transparency**: The technical underpinnings of cryptoassets enable the deployment of marketplaces for the exchange tokens that are significantly more transparent than existing financial systems. As such, there is the opportunity for significant reductions in the prevalence of fraud, money laundering, terrorist financing and other undesirable or illegal activities within both newly created cryptoassets and existing physical/digital tokens migrated to a cryptoassets form.
2. **They can be deployed and operated simply and at low cost**: Cryptoassets have the potential to significantly increase the operational efficiency of developing and operating token networks and associated marketplaces for those tokens. This lowers the barriers to creating efficient marketplaces for products that are not currently tokenized [e.g. asset classes such as real estate, wine, and diamonds] facilitating increased liquidity, and lower costs price discovery, and less fragmented markets for these products.
3. **They enable experimentation**: Recent deployments of cryptoassets have sought to establish new business models predicated on previously unimagined categories of tokens such as P2P markets for electricity or decentralized computing, in which consumers can rent-out their unused computing resources securely to other internet users, and get paid automatically and transparently via cryptoassets.

Source: Global digital Finance: Taxonomy for Cryptographic Assets

Regulatory harmonization and enforcement are key, yet challenging

Governments views on crypto-assets

EXAMPLES

Front-runners

- Japan: goal to nurture **innovative FinTech** services; cryptocurrencies legal payment method; no trading tax
- Switzerland: **first-mover in ICO regulations**, setting global standards; "Crypto-nation": liberal approach without compromising financial standards
- Singapore: **permissive** regulations, which do not distinguish between fiat currency and cryptocurrencies; Central Bank does not foresee Lehman-like meltdown

Fence-sitters

- UK: **priority in FS innovation agenda**; task force (FCA, Government, BoE) to present recommendation in Q218 together w/ EU; regulatory sandbox* available
- US: **no federal regulation & inconsistencies** between states, e.g. BitLicence operational in New York; pioneer allowing trading of cryptocurrency-related derivatives
- South Korea: **uncertainty** towards previously supportive stance; anonymous trading banned in Jan. 2018; ICO regulation under development

Opponents

- China: **banned** ICOs & cryptocurrency-related web access, froze related bank accounts; discourages mining

Supervisors and Regulators views

DNB

- **Developing regulatory framework**
- Acknowledges concerns around speculative nature of crypto-assets, not financial stability; need for harmonization in EU due to international nature of the market
- DNB and AFM regulatory sandbox* available; inviting banks for experiments

AFM

- **Acknowledges risks** cryptocurrencies are suitable for money laundering, terrorist financing, scams, deception and speculative hype (risk of a bubble) and ICOs are vulnerable to fraud, deception and manipulation
- **Calls for coordination** between national and international legislators and regulators

(ECB)

- **Developing regulatory framework**, to be published in 2H18; all the banks engaged with crypto-assets to be supervised; cryptocurrencies should fall under AML-IV
- Currently, **crypto-assets are not recognized as money nor payment means**; should not be accepted as collateral

(IMF)

- Small market size poses limited threat to financial stability; banks and regulators need to remain vigilant

*Regulatory sandbox is a "testing ground in which businesses can test innovative products, services and business models without immediately incurring all normal regulatory consequences of engaging in the activity in question".

Source: Group Research; press coverage; official websites; Internal analysis

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Industry effort

Number of community platforms and working groups have emerged, with the objective of providing support and practical solutions to companies wanting to achieve best practice.

Such platforms are improving public (and regulator) perception of token companies, who are increasingly being seen as willing to ensure investor protection. The following initiatives have been particularly popular among market participants for their work: **Global Digital finance, The Brooklyn Project, Crypto Valley Association**.

Global Digital Finance (GDF) is an industry body that drives the acceleration and adoption of digital finance technologies to support the next era of digital commerce. They have conducted a consultation on the Code of Conduct for Cryptoassets and a supporting Taxonomy.

The consultation closed on 31st August 2018, and we received over 500 individual submissions of feedback from over 100 individuals and organizations.

GDF has amassed a broad range of community participants since it's inception in February

140+

Industry Community Members
(some examples below)

20+

Global Regulators & Policy Makers
Outreach in progress

The Brooklyn Project is a platform that creates solutions to address investor protection issues and dispel uncertainty for market participants. The project has support from a range of academics, token companies and regulators, and has produced a range of open-source tools to assist companies, such as template documents, code snippets and thought leadership pieces.

The Crypto Valley Association is an independent association which supports market participants in Switzerland through policy recommendations, projects across verticals, research, and by organizing conferences, hackathons, and other industry events. The association has a defined mission, core values and both general and specific token sale codes of conduct for use by its members.

Source: Global digital Finance: Taxonomy for Cryptographic Assets

Looking forward

Despite the collapse in total coin market cap this year and also the failure of numerous opportunistic or less well thought through ICO projects, innovation in the crypto space continues apace, via either deployment of extensive funds raised during the hype of Q4 2017 issuance or increasingly professional ICO white papers;

Whilst very few Tier 1, 2, 3 traditional banks overtly have a crypto offering, there is lots of 'quiet' investigation, exploration and experimentation behind the scenes;

The big story of 2018 is the on-going evolution of 'institutional grade' crypto infrastructure. For example:

- Certain exchanges specialising in larger size liquidity provision, wholesale standard 'self-regulation' eg Coinbase Pro (GDAX), Coinfloor
- Growth of OTC market, 24/7, in size. Jump Trading, Cumberland, Flow Traders
- Crypto specific fiat banking services eg Noble
- Institutional custody eg Coinbase Custody, Vo1t

Banks and Fintech companies are exploring DLT solutions and some solution are starting to emerge.

Executive Summary Recap

- **Definition**: Crypto-assets are **digital assets** stored and exchanged electronically without a need for trusted intermediaries**.** Crypto. applications address financial **needs of Retail and Institutional clients**, i.e. Payments, Investments & Trading and Fundraising (ICOs)
- **Despite rapid growth,** crypto-asset market is still small compared to traditional asset classes. In order to scale up, several critical conditions need to be met. Among those, regulatory framework harmonization and enforcement are key, yet challenging. Despite disparate positions, banks are building option to enter this field.
- **Risks**: Generally, the token markets are nascent and are made up of a number of communities who have different goals and motives. The risks are multiples for investors and issuers. They will range from from the lack of standardization, lack of customer protection laws, the lack of Control and transparency concerning use of funds and the lack of Crypto understandings from certain investors. KYS/ALM and Cyber security are also high risks in this domain.
- **Regulation**: There is a great deal of uncertainty surrounding the legal and regulatory environment worldwide with regards to token offerings for both token issuers and token holders. Different countries have adopted a variety of approaches to token offerings, ranging from blanket bans (such as in China) to the application of existing laws or the development of new frameworks to encourage token issuers to conduct offerings within their jurisdiction (such as Gibraltar). This has led to a situation where there is a clear lack of regulatory consistency on a cross-border basis.
- **Industry effort**: number of community platforms and working groups have emerged, with the objective of providing support and practical solutions to companies wanting to achieve best practice. While these initiatives lack the teeth that regulators have, they are a useful vehicle for establishing best practice, as they can foster an eco-system of good conduct that could serve as a guiding framework for policymakers, and simultaneously help token companies avoid some of the pitfalls identified above. Further, such platforms are improving public (and regulator) perception of token companies, who are increasingly being seen as willing to ensure investor protection. The following initiatives have been particularly popular among market participants for their work: Global Digital finance, The Brooklyn Project, Crypto Valley Association.

Source: Global digital Finance: Taxonomy for Cryptographic Assets

APPENDIX

Glossary

Concept	Definition
DLT	Acronym for “Distributed ledger technology”. Software and protocols that use cryptography and enable a log of transactions to be recorded across a network of computers in a peer-to-peer way and without the need for a central trusted intermediary.
Digital asset	Anything that exists in a binary, electronic format and comes with the right to use. Examples: electronic document file, e-mail, crypto-assets and Central Bank digital currency.
Crypto-asset	Digital asset that users store and exchange electronically in a peer-to-peer way without the need for trusted intermediaries, and that are enabled by a network of computers running publicly-accessible DLT software. There are two types of crypto-assets: cryptocurrencies and tokens.
Cryptocurrency	Crypto-asset designed to work as a peer-to-peer medium of exchange or means of payment, frequently referred as a “coin” or “digital money”. Examples: bitcoin (BTC), Ether (ETH) and Ripple (XRP).
Token	Crypto-asset designed to work as a medium of exchange within a limited ecosystem and to offer an additional feature, such as representing right to access product or service or ownership of assets (e.g. shares). Examples: EOS, Tron (TRX) and Tether (USDT).
CBDC	Acronym for “Central Bank Digital Currency”. Publicly-accessible digital form of fiat currency issued by the state and w/ legal tender status. Not a crypto-asset, as does involve a trusted intermediary. No real-life examples beyond ideas such as the e-krona at the Swedish Central Bank exist.
Crypto. company	Companies that: 1. are not supervised and regulated by banking authorities; and 2. operate crypto. payment services, operate crypto. investment and trading services, raised funds via ICOs or mine cryptocurrencies.
Crypto. application	Crypto. payment services, crypto. investment and trading services, ICO/fundraising services and cryptocurrency mining.
Crypto. payment service	Services that enable users to send and receive funds in fiat currency and that are enabled by cryptocurrencies or tokens. Examples: Bitpay, Circle Pay, Veem and Ripple’s xRapid service.
Crypto. exchange	Type of company that enable users to buy and sell cryptocurrencies and/or tokens for investment and trading purposes. Crypto. exchanges provide crypto. investment and trading services.
ICO	Acronym for “Initial Coin Offering”. A means of fundraising that some companies use and that avoids traditional intermediaries (e.g. VCs, banks, stock exchanges). Companies or organizations that raise funds via ICOs give tokens or cryptocurrencies that can be traded in crypto. exchanges to investors. In return, they receive cryptocurrencies or fiat money from investors. The status of ICO-generated tokens as an equity security is controversial

Source: Internal analysis

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Unique value proposition of main crypto-assets

Cryptocurrencies

Rank	Name	Value proposition
1	**Bitcoin**	Digital gold
2	**Ethereum**	Programmable contracts and money
3	**Ripple**	Enterprise payment settlement network
4	**Bitcoin Cash**	Bitcoin clone
5	**Litecoin**	Faster bitcoin
6	**Cardano**	Layered currency and contracts
7	**Stellar**	Digital IOUs
8	**IOTA**	Internet-of-things payments
9	**NEO**	Chinese-market Ethereum
10	**Monero**	Private digital cash

Tokens

Rank	Name	Value proposition
1	**EOS**	Scaling decentralised applications
2	**TRON**	In-app-purchases
3	**VeChain**	Supply chain item Ids
4	**Tether**	Price = 1 USD
5	**ICON**	Connecting independent blockchains
6	**OmiseGO**	Banking, remittance and exchange
7	**Binance Coin**	Pay Binance exchange fees
8	**Zilliqa**	High throughput blockchain network
9	**Aeternity**	Decentralized apps (prototype)
10	**Ontology**	Multi-chain project + collaboration platform

Note: rank as of May. 9th, 2018.
Source: TechCrunch, “100 cryptocurrencies described in four words or less”, Nov. 2017; CoinMarketCap; white papers; Internal analysis