EY research: initial coin offerings (ICOs)

December 2017

Building a better working world

Executive summary

- **The total amount of funds raised via ICOs is approaching US$4 billion, twice the volume of venture capital (VC) investments in blockchain projects.** Since late 2017, the ICO volume has been slowing down, and fewer projects are reaching fundraising goals.
- **ICO investors are buying tokens, which are, in most cases, a means of payment on a blockchain platform.** The platform itself is usually in the development stage at the time of the ICO, and the token contains a minimum of the issuer's obligations.
- **The need for a blockchain and token is often unjustified.** The most successful projects are within a blockchain infrastructure, and the most successful platform is Ethereum.
- **Because most ICOs use the Ethereum platform,** it has led to an overloaded network and an increase in Ether price, which has led to an increase in ICO costs. Terms and functionality of the token are defined in smart contracts with program code that can contain errors or latent terms.
- **ICO valuation is often based on "fear of missing out"** instead of project development forecasts and the nature of token. A lack of fundamental valuation leads to extreme token price volatility in post-ICO trading.
- **The volume of ICOs draws hackers' attention**. More than 10% of ICO proceeds are lost as a result of attacks. In addition to losing funds and increasing project risk, investor personal data is at risk of being exposed.
- **Most regulators are moving from ignoring ICOs to banning them or regulating them by existing laws in accordance with the nature of the token.** Meanwhile, market players are developing self-regulation. One of the most interesting initiatives is the Simple Agreement for Future Tokens (SAFT).
- **ICOs have become synonymous with hype and excessive risk, yet they can actually help protect investors.** The future of ICOs will be determined by the transparency of blockchain technology and the ability to set new standards that are accepted by all participants.

ICO funding volumes (total and per project) are based on open sources. We did not verify or confirm this data. Because of high volatility, the data at the time of publication and use can change.

ICO market

Scope

Total projects analyzed

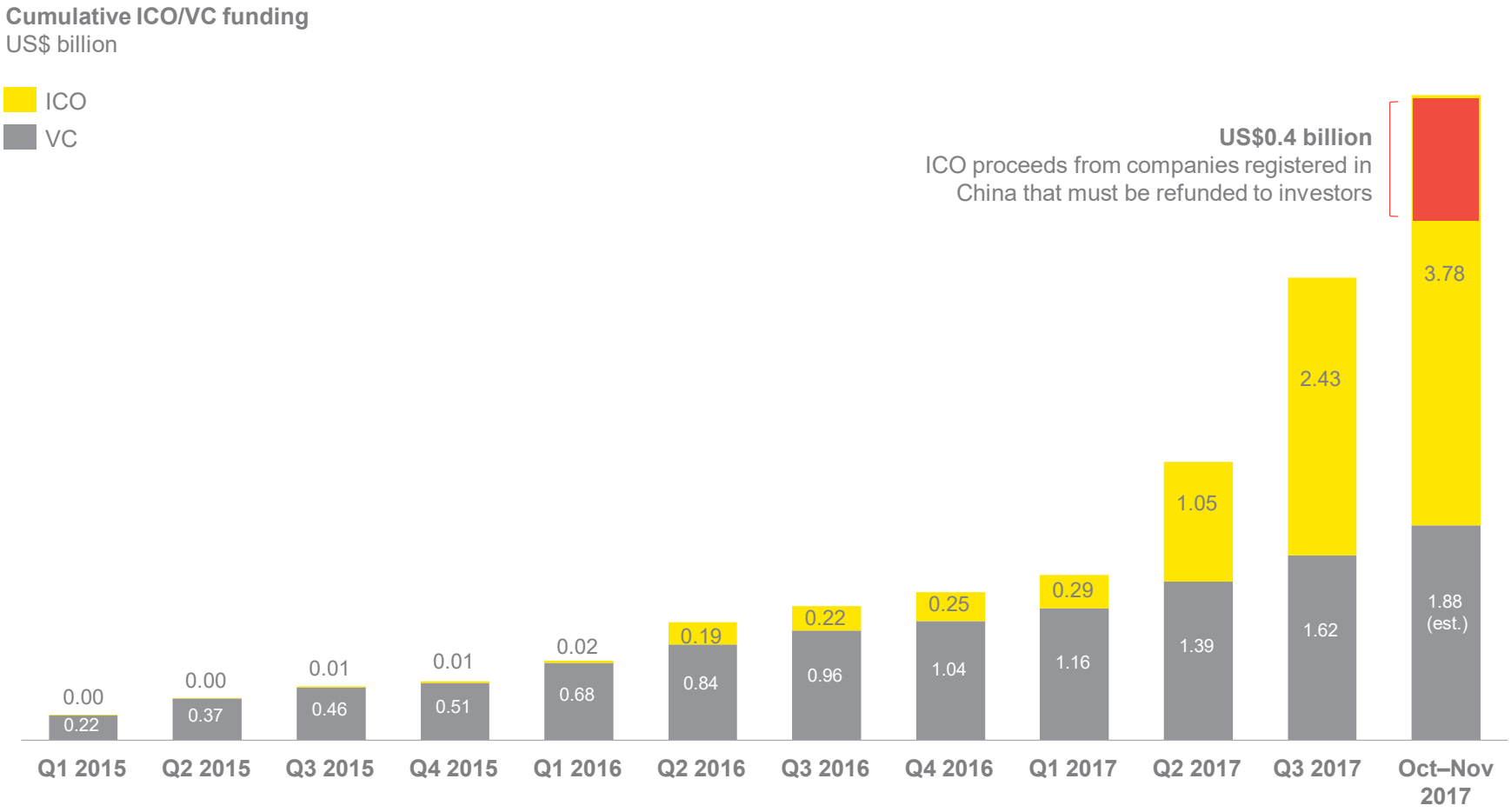
372

Projects with detailed analysis

110

(87% of funds raised)

ICO market
Total ICO proceeds are approaching US$4 billion and have exceeded venture capital investments in blockchain projects

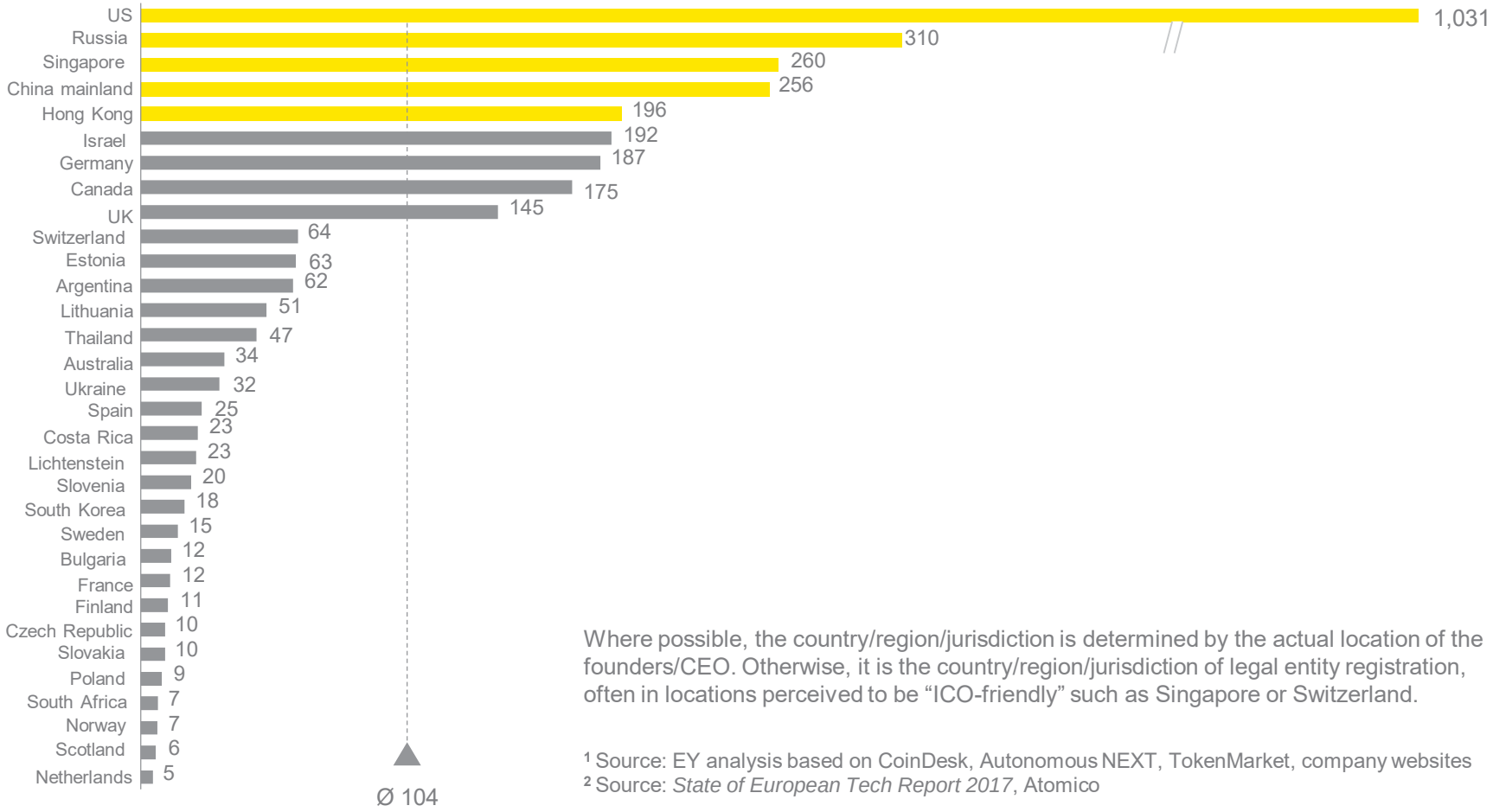


Data based on open sources – ICO market is not regulated, there is no standardized reporting and volatility is high.

Sources: CoinDesk, CB Insights, IFCERT

ICO market
Most ICO projects originate in the US, Russia and China

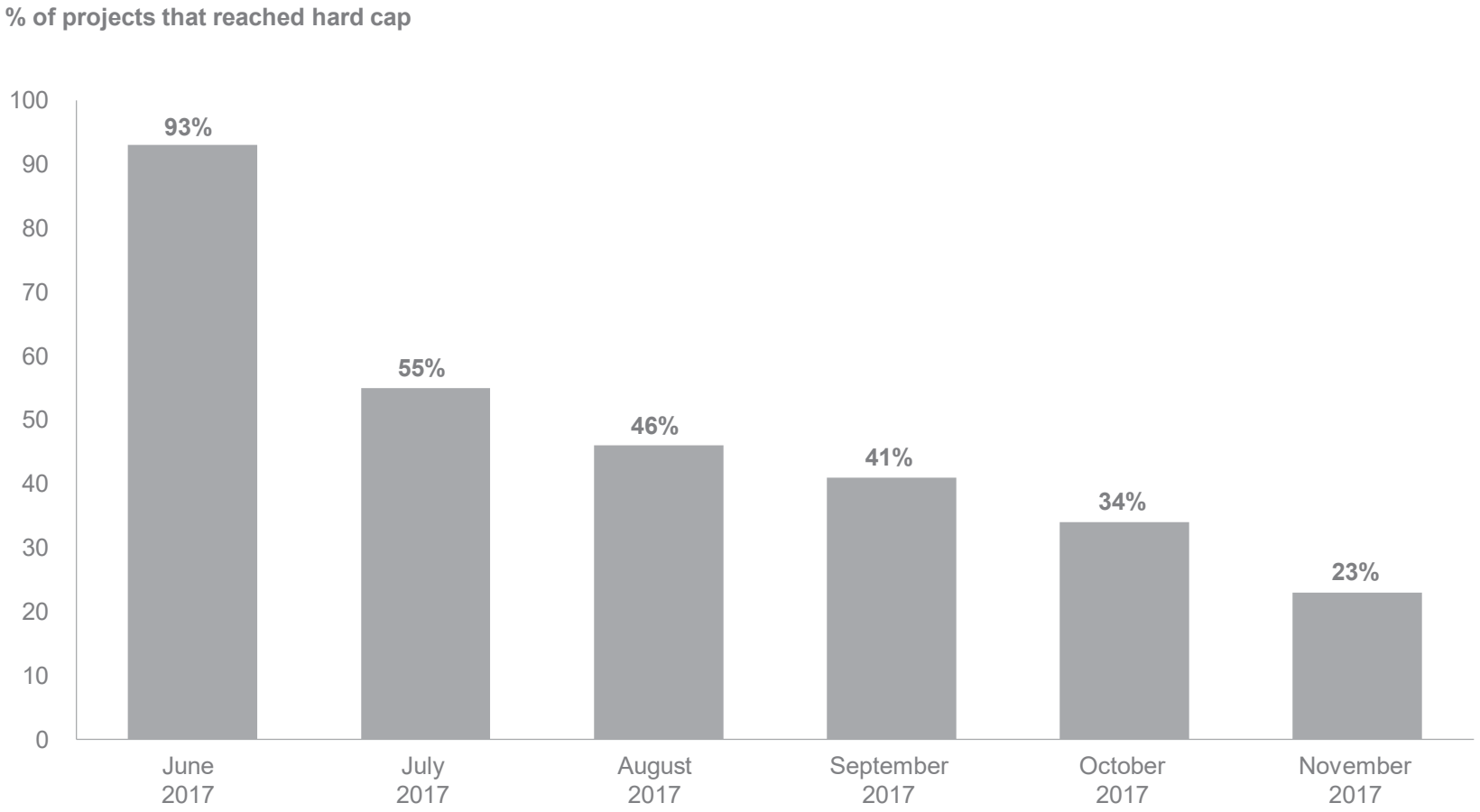
ICO projects by country/region/jurisdiction
US$ Million[1]



Where possible, the country/region/jurisdiction is determined by the actual location of the founders/CEO. Otherwise, it is the country/region/jurisdiction of legal entity registration, often in locations perceived to be “ICO-friendly” such as Singapore or Switzerland.

[1] Source: EY analysis based on CoinDesk, Autonomous NEXT, TokenMarket, company websites
[2] Source: *State of European Tech Report 2017*, Atomico

ICO market
Fewer projects hit fundraising goals: in November 2017, less than 25% hit goals, compared with more than 90% in June



Sources: Coinschedule, Architect Partners, TokenData

Public blockchain and ICO

Public blockchain and ICO

Public (open/“permission-less”) **blockchain is a slow and expensive database** that guarantees consensus on transactions between independent participants without an intermediary.

Some of the most successful projects are within finance or infrastructure for other blockchain projects and some of the more successful ICOs are on the Ethereum platform. Despite multiple forecasts, use cases of public blockchains are limited because of the low speed, high transaction costs and existence of effective centralized solutions.

Most ICO white papers lack a clear explanation of the business reasons for blockchain and token currency (utility token). As a result, many projects never move from the ideation stage to implementation, or the implementation is flawed. Projects going into production often start to accept fiat currency, reducing the value of the token.

Public blockchain and ICO
Most white papers lack justification of blockchain use

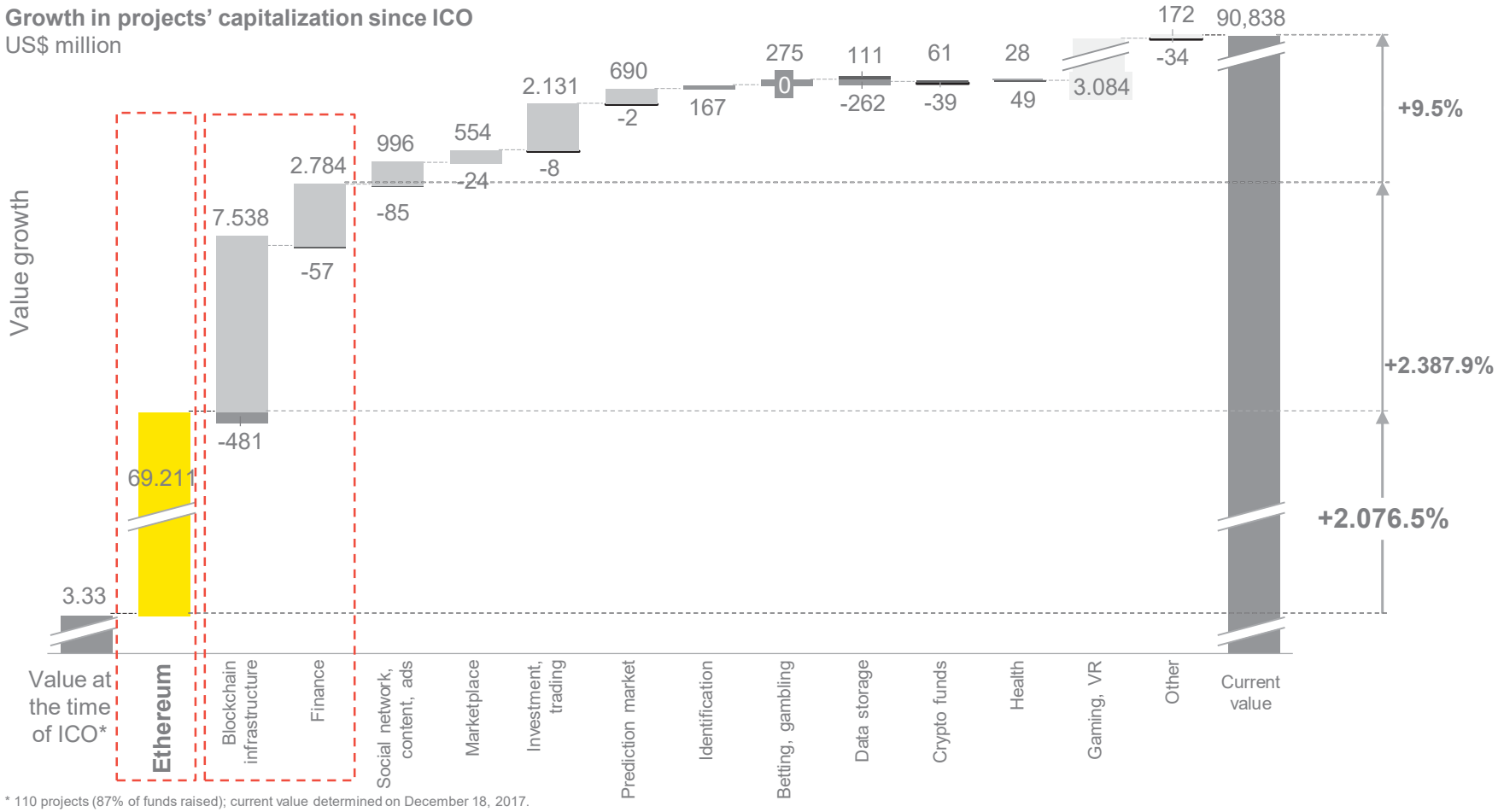
Projects try to attract investors by introducing blockchain in new markets. White papers contain many clichés that attract inexperienced investors, with no reasonable justification for blockchain use.

The most commonly used phrases in white papers:

- **Next-generation platform**
- **First project to unlock multibillion market of < … >**
- **Decentralized network that puts users in control/the driver's seat**
- **We are creating a community/ecosystem/economy**
- **No corrupted central authority**
- **Creating a Web3**
- **Most undervalued token**
- **Making the world a better, "blockchained" place [1]**
- **The next decentralized worldwide cryptocurrency … to broaden the possibilities of uses and to increase the number of users by simplifying the process of managing cryptocurrency to the maximum [2]**

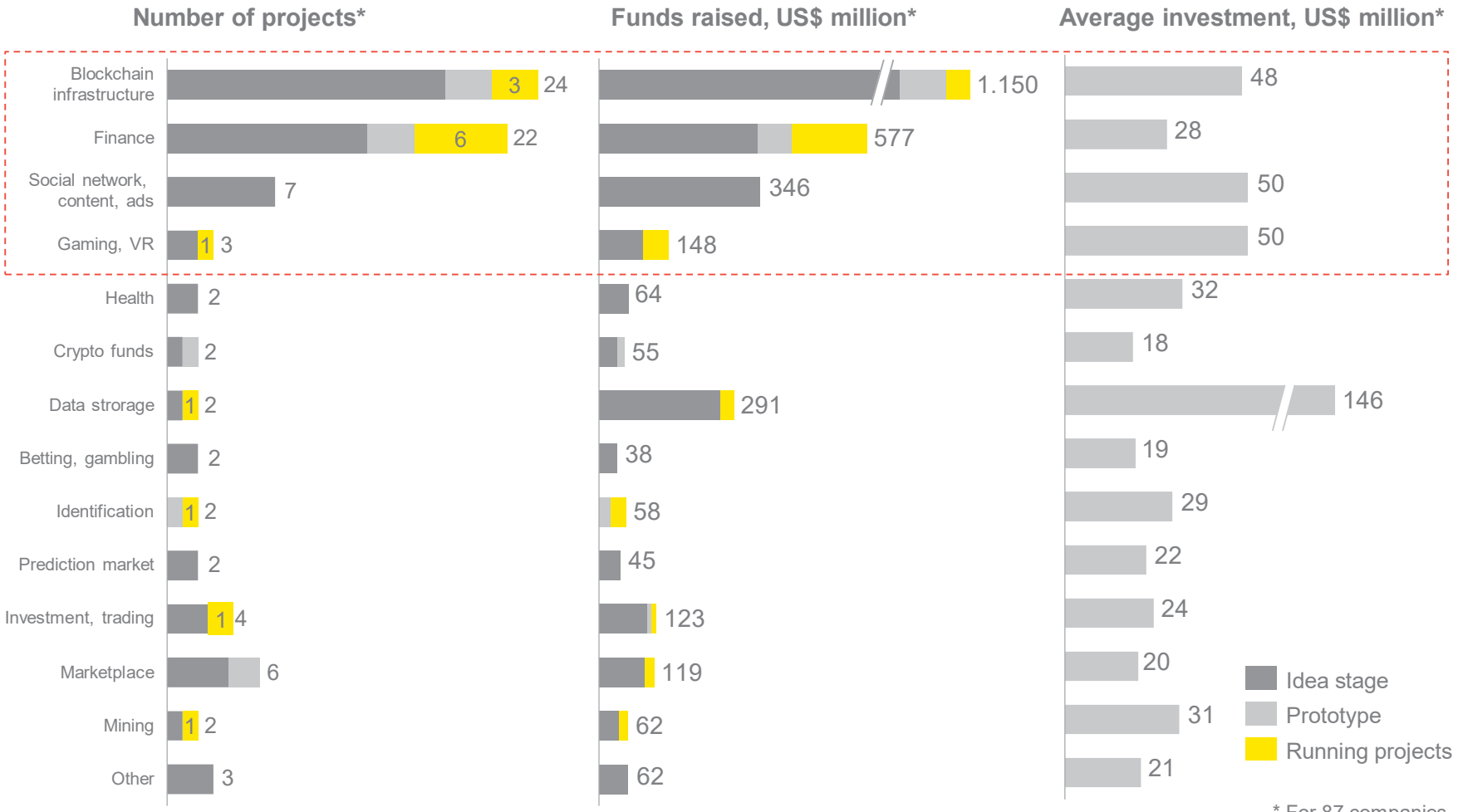
[1] "Silicon Valley" (TV series)
[2] PlexCoin, assets frozen by the FBI Sources: companies webpages

Public blockchain and ICO
Market cap for ICO projects: the largest gainers are Ethereum and other blockchain infrastructure projects



* 110 projects (87% of funds raised); current value determined on December 18, 2017.
Source: EY analysis based on CoinDesk, CoinMarketCap, Autonomous NEXT, TokenMarket, company webpages
Because of high volatility, the data at the time of publication and use can significantly change.

Public blockchain and ICO
Segment leaders by volume: blockchain infrastructure, finance, gaming platforms, social networks and data storage



Source: EY analysis based on CoinDesk, CoinMarketCap, Autonomous NEXT, TokenMarket, company webpages

Public blockchain and ICO
So far, blockchain has proved to be useful in a limited number of cases

Public/“permission-less” blockchain is a slow and expensive database that provides a guarantee of consensus between independent participants without an intermediary.

When public blockchain is useful:

- There is a large number of transaction participants
- Participants are independent, and there is no trust
- Participants are willing to pay for validating each transaction
- Existing centralized intermediary is worse than blockchain because of cost, security or lack of trust
- Errors in transactions that require interference of an intermediary are rare
- Participants do not mind transparency of transactions
- None of the participants controls more than 50% of the nodes (for a new blockchain)
- For smart contracts that relay on external data, there are reliable sources ("oracles")
- Assets involved in transactions can be "tokenized“

When it is not:

- Speed is essential
- There is a need to provide "the right to be forgotten"
- There are few nodes, and there is no way to ensure consensus confirmation
- Anonymity/confidentiality of transactions is required*
- Complex pricing and risk of manipulation of utility token price exist
- There are changes in contract terms
- There are risks of frequent/substantial disputes

*“Zero Knowledge” confirmation (confirmation without information in public blockchain) might solve confidentiality issues, but it is still being developed and much more energy-intensive than even PoW.

Public blockchain and ICO
Public blockchain is effective in certain cases; proprietary utility token is rarely needed

Despite forecasts, successful adoption of public blockchains in areas other than finance, blockchain infrastructure and logistics is yet to be seen. Most likely, this is because of low speed, high transaction costs and the use of centralized/cloud solutions.

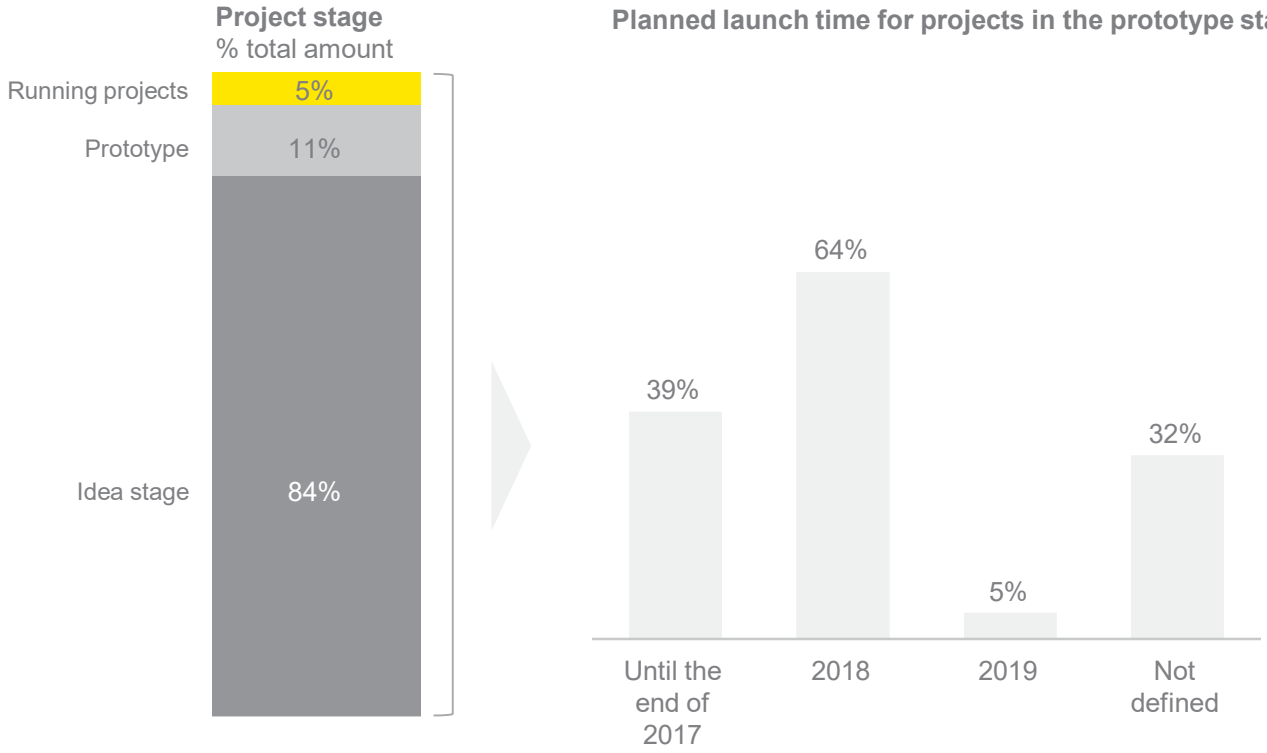
	Blockchain projects in the production stage	
Category	**Public**	**Private**
ICO	Yes	
Finance	Yes	Yes
ID and personal data	?	
Ownership	?	
Shared use of assets	?	
Voting		?
Logistics, shipment and delivery	?	Yes
Energy supply transactions		?
Prediction markets (gambling)	?	?

? There are projects in the development stage; usage results are yet to be seen.

Source: EY analysis based on data from company sites

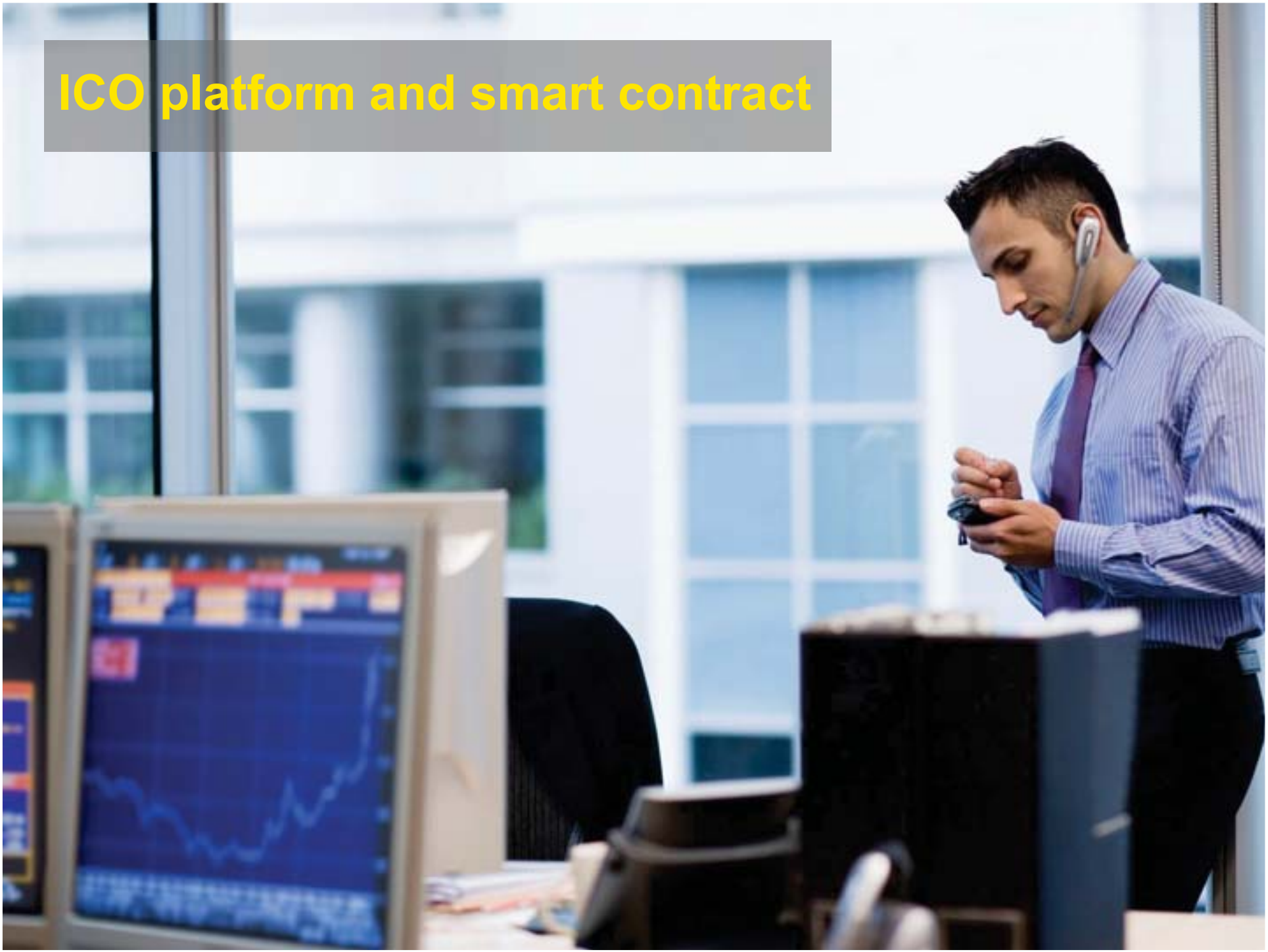
Public blockchain and ICO
Planned launch of most projects is within 1 to 2 years after ICO

Selling the idea is easier than selling an actual service: most ICO projects are in prototype stage, and their launches are expected in a year or more after the ICO.



Source: projects' white papers, Bloomberg, Token Report, Coinschedule, RBK

ICO platform and smart contract



ICO platform and smart contract

ICO projects use either existing or custom blockchain platforms. In the latter case, they need to create a network, attract miners and pay for transaction confirmation.

Most projects use existing platforms: Waves and Ethereum, the latter of which is the leader by far. Because of its popularity, the Ethereum network is overloaded and the growing demand raises the cost of Ether and the cost to run ICOs.

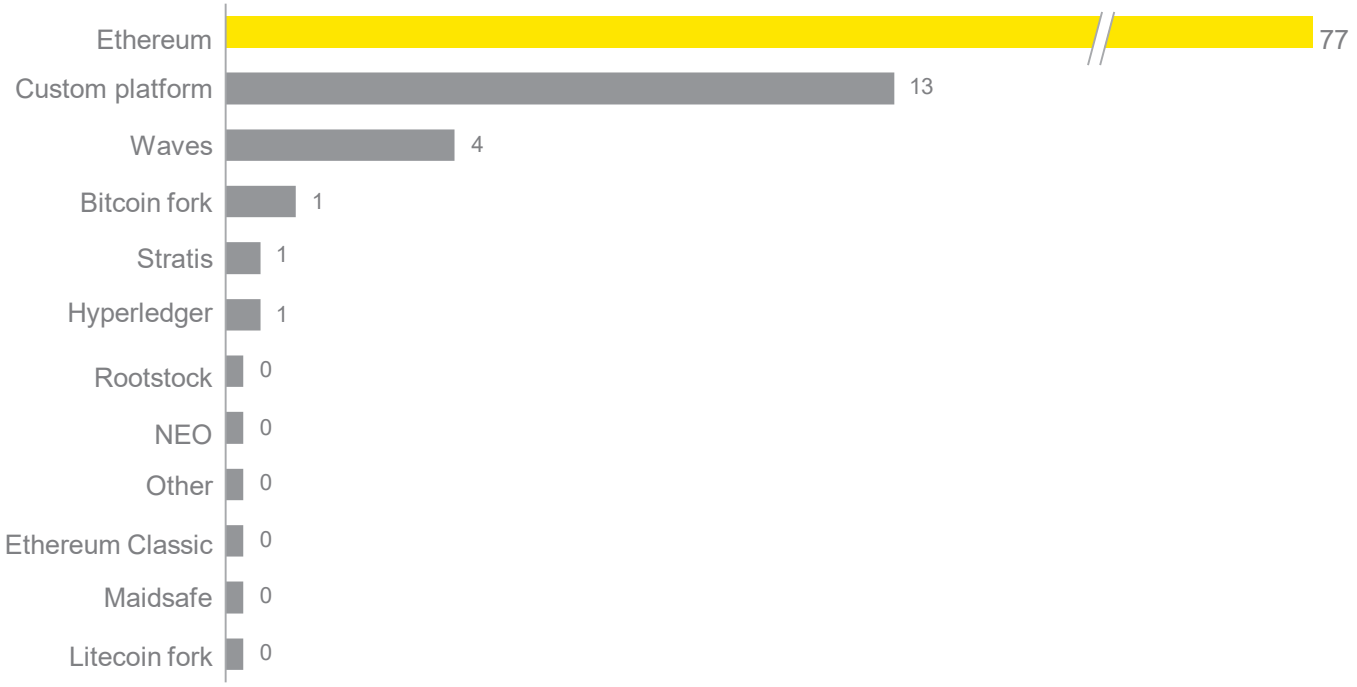
Terms and functionality of the token are defined in smart contracts with program code that may contain errors or latent terms and use unsafe algorithms that may result in losses for both investors and founders.

Sources: IcoWatchList, Fortune, Business Insider, Medium

ICO platform and smart contract
Ethereum – leader among platforms for ICOs

Projects use either existing or custom blockchain platforms to run ICOs. In the latter case, they need to create a network, attract miners and pay for transaction confirmation. Most projects use existing platforms: Waves and, the leader by far, Ethereum.

Market share of blockchain platform for ICOs
% of total number of projects

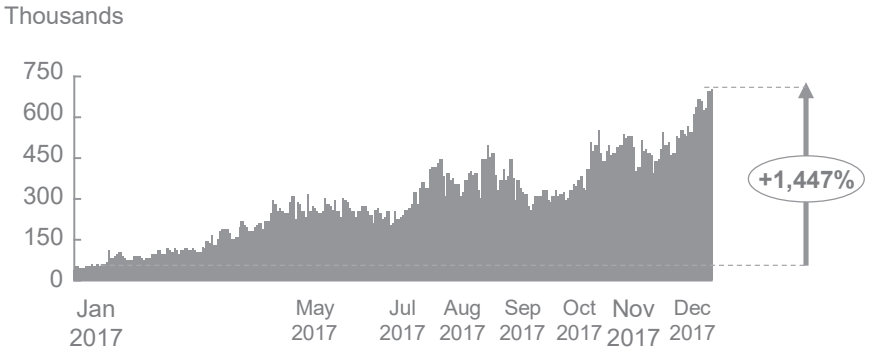


Source: ICO Watch List, December 2017

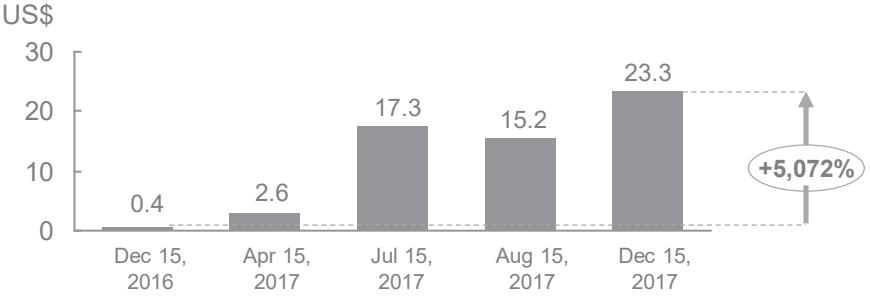
ICO platform and smart contract Ethereum: Speed falls, prices increase

Because of the popularity of Ethereum, the network is overloaded and the growing demand raises the cost of Ether and the cost to run ICO.

Number of transactions on Ethereum network

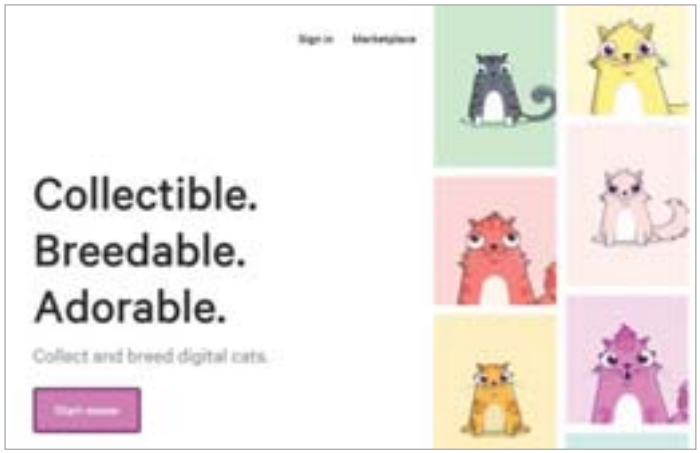


Illustrative* transaction costs for deploying a smart contract



* The amount of gas required is 2.5 million unit. The price of gas in the period under review was at the level of 21-23 Gwei per unit.

On November 28, 2017, Ethereum was struck by CryptoKittens, a distributed application featuring virtual cats (like Tamagotchi of the 1990s)



- A week after its release, the application was using up to 21% of the total Ethereum network.
- Many projects postponed ICOs because the network was overloaded. Others planned to move from Ethereum to other blockchain platforms (e.g., Kik).
- The popularity of CryptoKittens can lead to a development of analogs that will further overload the network and increase the cost of smart contract transactions.

Sources: ETH Gas Station, Etherscan, CoinMarketCap, CoinDesk

ICO platform and smart contract
Smart contracts can contain errors or latent terms

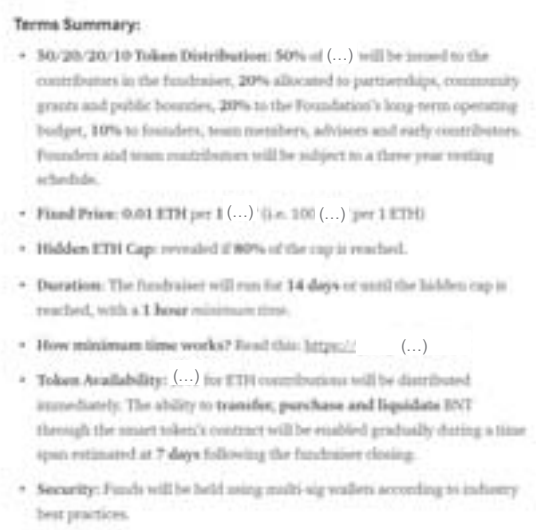
Terms and functionality of a token are defined in smart contracts with program code that can hide risks for all ICO participants. It can contain errors or latent terms or use unsafe algorithms that may result in losses for investors, founders or platform users.

Hidden terms	Smart contract code can contain hidden terms that are not explicitly disclosed to investors
Unsafe algorithms	Insufficient testing of smart contract code, as well as the use of external public libraries, can lead to damaging consequences: ► Unintentional violation of smart contract logic through execution of a wrong order or number of functions used, as well as the use of nonstandard functions. ► Intentional influence on the smart contract logic with the purpose of breaking internal limits, for example, on funds withdrawal

ICO platform and smart contract
Smart contract code can contain hidden terms

Smart contract code of an ICO project contained terms that were not explicitly disclosed to investors.* As a result, the value of tokens was unexpectedly diluted.

Text for investors: 18 lines
Sources: Medium, projects' webpages



Terms Summary:

- **30/20/20/10 Token Distribution:** 50% of (…) will be issued to the contributors in the fundraiser, 20% allocated to partnerships, community grants and public bounties, 20% to the Foundation's long-term operating budget, 10% to founders, team members, advisors and early contributors. Founders and team contributors will be subject to a three year vesting schedule.
- **Fixed Price:** 0.01 ETH per 1 (…) (i.e. 100 (…) per 1 ETH)
- **Hidden ETH Cap:** revealed if 80% of the cap is reached.
- **Duration:** The fundraiser will run for **14 days** or until the hidden cap is reached, with a **1 hour** minimum time.
- **How minimum time works?** Read this: https:// (…)
- **Token Availability:** (…) for ETH contributions will be distributed immediately. The ability to **transfer, purchase and liquidate** BNT through the smart token's contract will be enabled gradually during a time span estimated at **7 days** following the fundraiser closing.
- **Security:** Funds will be held using multi-sig wallets according to industry best practices.

Smart contract: 479 lines of code
Source: Etherscan

Contract Source Code </>

```
456    {
457        return processContribution();
458    }
459
460    /**
461        @dev handles contribution logic
462        note that the Contribution event is triggered using the se
463
464        @return tokens issued in return
465    */
466    function processContribution() private
467        active
468        etherCapNotReached(msg.value)
469        validGasPrice
470        returns (uint256 amount)
471    {
472        uint256 tokenAmount = computeReturn(msg.value);
473        assert(beneficiary.send(msg.value)); // transfer the ether
474        totalEtherContributed = safeAdd(totalEtherContributed, msg
475        token.issue(msg.sender, tokenAmount); // issue new funds t
476        token.issue(beneficiary, tokenAmount); // issue tokens to
477
478        Contribution(msg.sender, msg.value, tokenAmount);
479        return tokenAmount;
```

Text disclosed to investors	Code terms
If the sale goes over the "hidden cap," it would stop immediately at the end of this first hour.	The project team can change the duration of the ICO at any time, diluting the value of the token.
Not mentioned in text	Transactions using the token can be disabled by the team at any time. The team can issue new tokens at any time. The team can DESTROY tokens at any time.

* Some of the issues were fixed, and none of them were made with fraudulent intent, according to the team.

[1] Sources: Fortune, Business Insider, Medium, public audit report of project smart contract.

Token valuation

Token valuation

- **Current token valuation is more like a gold valuation or a fashion item in high season when a limited supply cannot meet high demand**. With balanced demand and supply, the valuation would be determined by project forecasts and token nature. But in most cases, it is determined by hype, white paper quality and token sales techniques.
- **The most common type of token sold during an ICO is for means of payment on a blockchain platform or "utility token."** Other types of tokens (security or an asset) are rarely used.
- **The traditional token valuation as a means of payment is based on parameters that are difficult to determine at the development stage** – balance between the number of tokens (T) and their turnover for the period (V) with the price (P) and the volume of services (Q) on the platform for the same period: TV = PQ.
- **Also, tokens have a dual nature, which makes valuation even more difficult**. Investors expect an increase in token price and customers – with a decrease in the cost of services, which is expressed in tokens. So the value of a utility token is inverse to the cost of a service unit.
- **ICO preparation and sales technique are the main factors that drive capitalization**. There are two main ways of token sale:
  1. Capped funding, when tokens are sold at a fixed price.
  2. Uncapped funding, when token price is established at the end of an ICO. Capped sales usually create a rush, while uncapped may create unexpected dilution due to uncertainty in total funding until the end of an ICO.

Token valuation
ICO valuations are based on “fear of missing out” (FOMO) while it should be based on project development forecasts and nature of the token

The most common type of token sold during an ICO is for a means of payment for services on a future blockchain platform. Valuation depends on many parameters that are difficult to determine at the development stage. In most cases, valuation is determined by hype, white paper quality and token sales technique.

How a token *should* be valuated:
Token types and forecasts

Security	▸ DCF, multiples
Asset/collectable	▸ Based on the value of an asset backing the token
Means of payment (utility token)	▸ Determined by the balance between the number of tokens (T) and their turnover for the period (V) with the price (P) and the volume of services (Q) on the platform for the same period: TV = PQ ▸ The value of the token is inverse to the cost of services, which creates valuation loop. ▸ After going live, projects often start to accept fiat currency, reducing the value and price of the token

How token is *actually* valuated :
Promotion and ICO sales technique

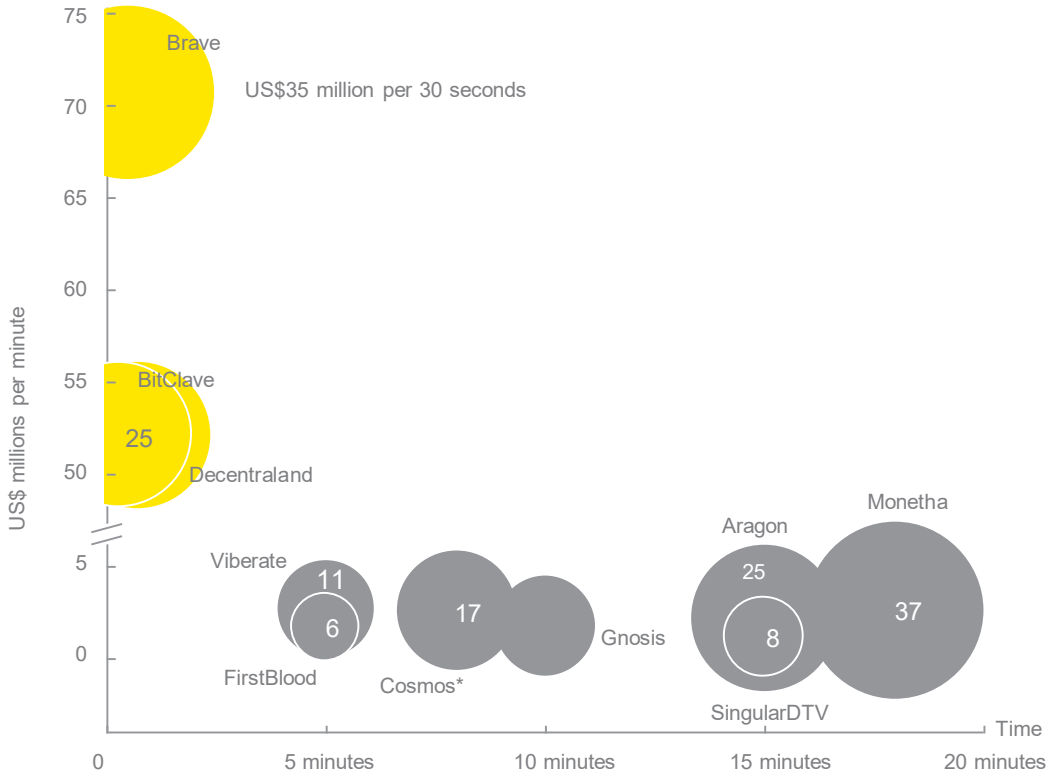
Limited time/funds	▸ *Capped* funding when tokens are sold at a fixed price. Usually create rush and funding round closing in minutes or seconds. ▸ *Uncapped* funding, token price is established at the end of an ICO. This often creates unexpected dilution due to uncertainty in total funding until the end of an ICO and the inability to reverse transactions. Many investors wait until the last hour, creating an order overload and network jam.
Currency of funds raised	▸ Token sale in several currencies (crypto/fiat) on several platforms creates possibility of an arbitrage and xRates spikes.
Bounty	▸ Discount for early investors. Bounty tokens are often sold-out right after trading has begun, crashing the price of a token.
Token emission\ and withdrawal	▸ Founders can withdraw tokens from market, issue new ones and change token functionality. This increases the uncertainty and price volatility.

Sources: EY Analysis

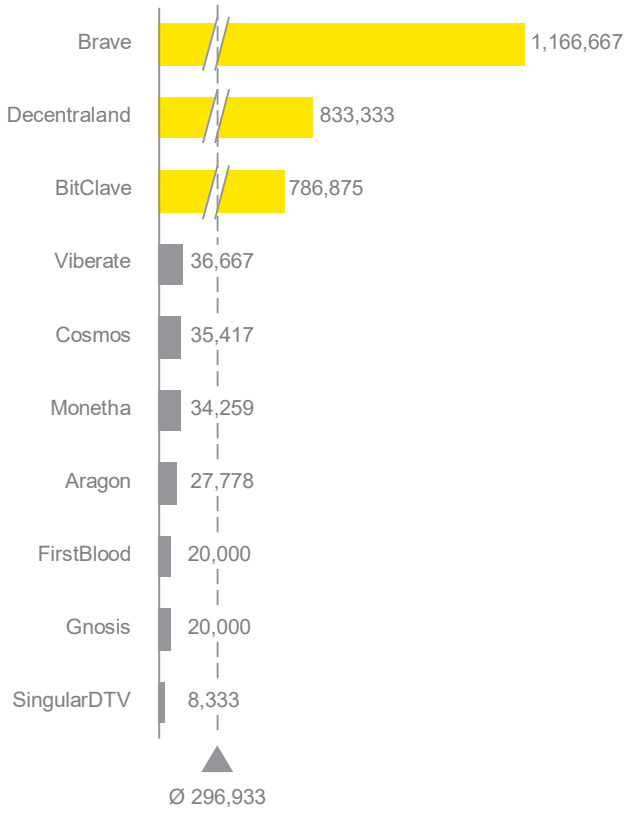
Token valuation
FOMO makes investors transfer funds at record speeds

Capped sale of hyped projects creates an unprecedented rush. The duration of some ICOs is reduced to seconds. The 10 projects with the lowest durations attracted funds at an average speed US$300,000 per second.

Volume and speed of fundraising



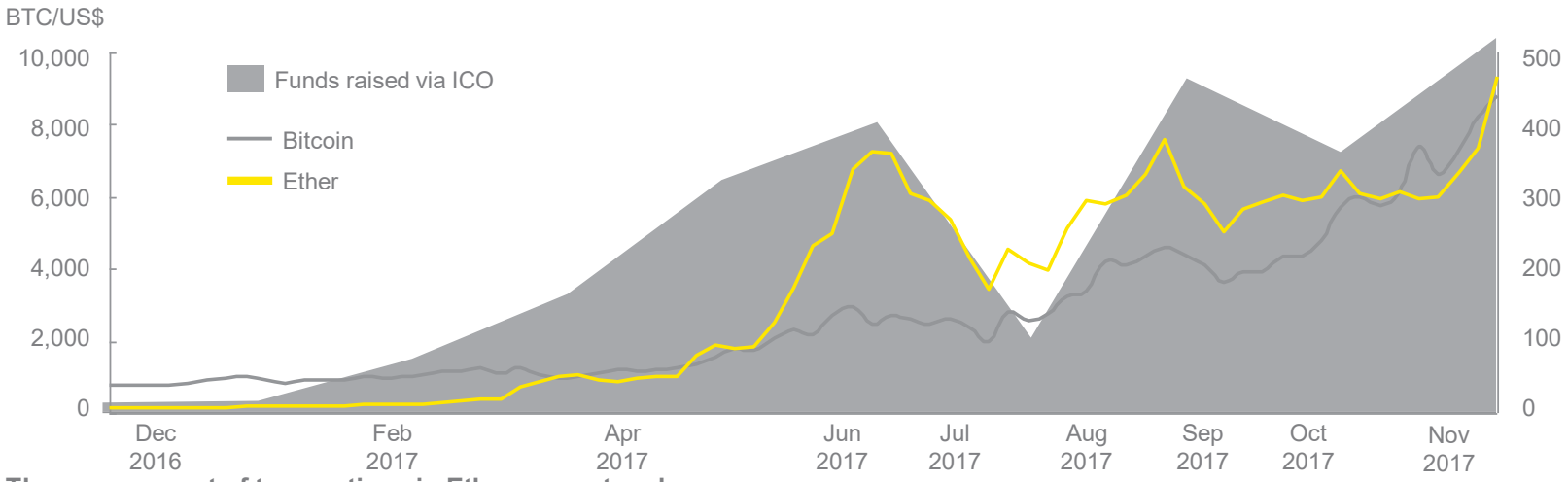
Speed of fundraising
US$ per second



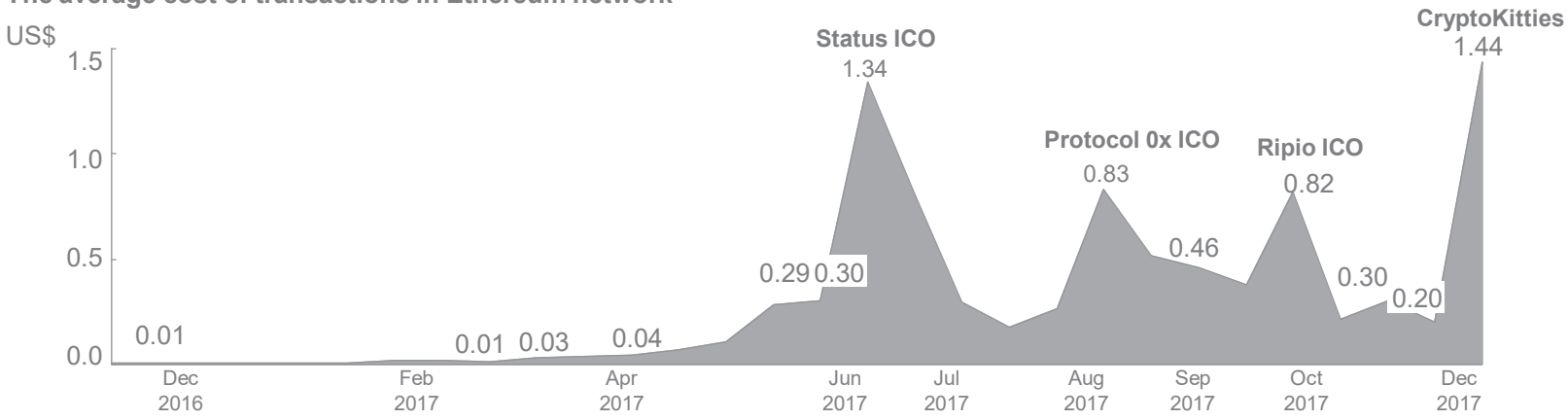
Source: Bloomberg, TechCrunch, Anycoin, Reuters, Forbes, company websites. As of November 2017.

Token valuation
ICOs fuel demand for Ether and bitcoin (BTC); growth of Ether price leads to an increase of transaction costs on the Ethereum network

Growth in BTC ETH price/funds raised

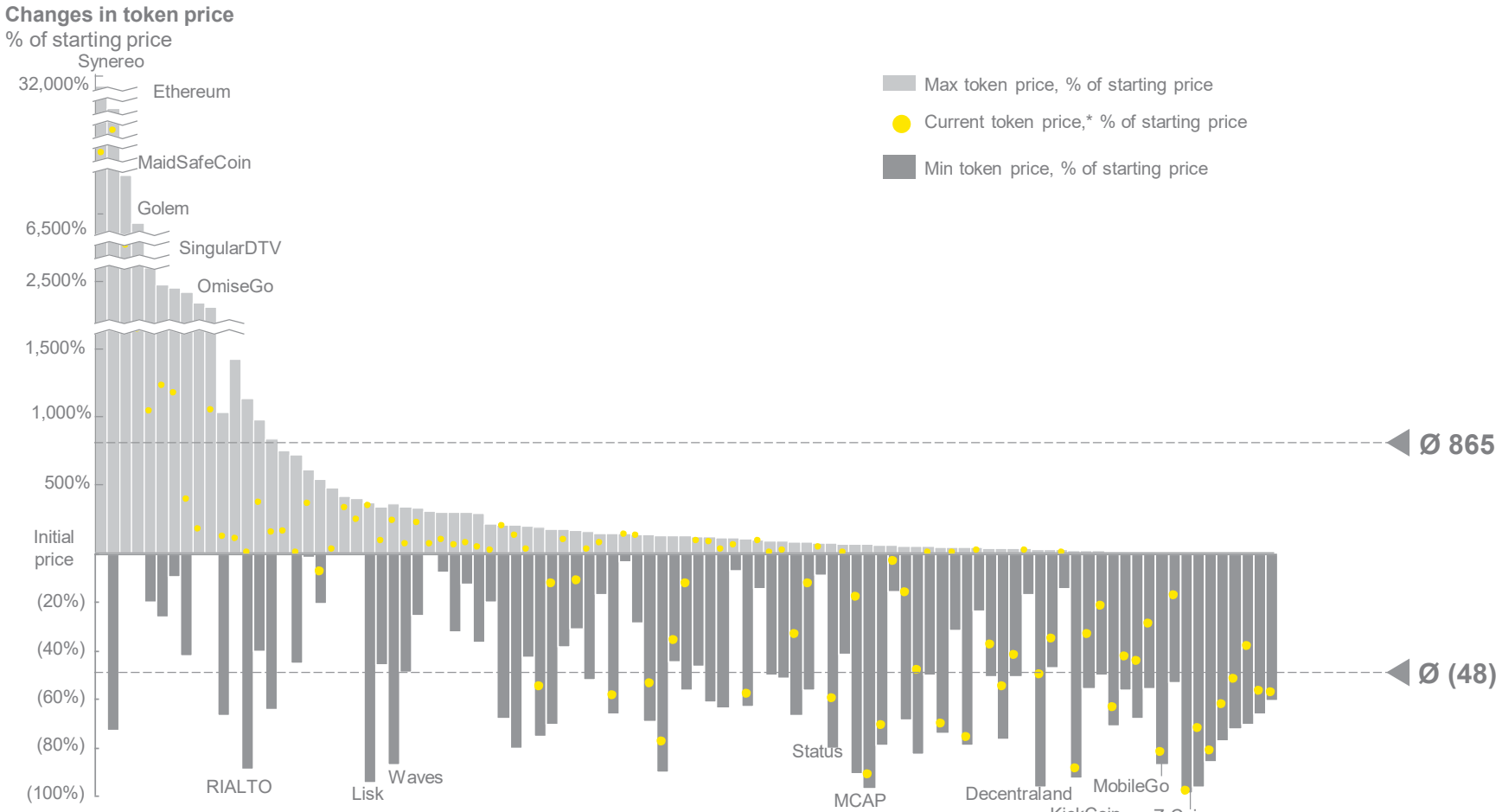


The average cost of transactions in Ethereum network



Sources: CoinMarketCap, CoinDesk, BitInfoCharts

Token valuation
The lack of fundamental valuation leads to extreme volatility when trading begins



* The starting price: the first price when listing on the stock exchange. Current price: on 11/16/2017
Source: based on data from CoinMarketCap
Because of the high volatility, the data at the time of publication and use can significantly change.

Security

Security

- The speed and size of the ICO market draw hackers' attention. Ten percent of ICO funds are lost as a result of attacks. Hackers are attracted by the rush, absence of a centralized authority, blockchain transaction irreversibility and information chaos.
- Project founders focus on attracting investors and security is often not prioritized. Hackers successfully take advantage – the more hyped and large-scale the ICO, the more attractive it is for attacks.
- Both projects and investors are exposed to attacks. The most common types of attacks include substituting wallet addresses, accessing private keys, stealing funds from wallets and stealing funds from exchanges.
- Phishing is the most widely used hacking tool during an ICO. Beginning in early 2017, the frequency of such attacks began to grow, driven by the simplicity and effectiveness.
- Hacking also leads to indirect losses: for example, a project's loss of reputation and investors' loss of their sensitive personal data.

Source: EY, Group-IB analysis

Security
ICO participants become target for cyber attacks

The speed and size of ICO market hackers' attention. Ten percent of ICO funds are lost as a result of hacking attacks. Hackers are attracted by the rush, absence of a centralized authority and blockchain transaction irreversibility.

The main types of attacks are:

- Phishing websites
- Distributed denial of service (DDoS) attack
- Hacking of a website/web application
- Cyber attacks through company employees
- Cyber attacks on the IT infrastructure
- Cyber attacks on investors
- Hacking of exchanges and wallets

Source: EY analysis, Group-IB

Security
Phishing is the most widely used hacking tool during the ICO

Phishing is the most common form of funds theft during ICOs. Its popularity is attributed to its simplicity and effectiveness. Hackers steal of up to US$1.5 million in ICO proceeds per month. Scammers either request a funds transfer to their wallet or swindle private keys to investors' wallets.

Example: hedge fund **Numeraire** (US)

Original webpage

Phishing page

The clone was registered on August 9, 2017, and distributed via the Slack messenger on behalf of a hedge fund "employee." Attackers lured the private keys and stole all the funds from the user's account. The same scammers have created phishing copies to seven other cryptocurrency projects. During August 2017 alone, they stole almost US$1.4 million from 350 wallets.

Criminals use DDoS attacks to disable the original site and publish phishing site addresses on web forums and social media that promote ICOs. Investors, driven by FOMO, do not check the site, and transfer funds to the criminal's address. The likelihood of crypto funds being returned is close to zero.

Security
Hacking of crypto exchanges leads to loss of both funds and personal data

Loss of funds

The average bank loss from a hacking attack is US$1.5 million and funds are usually insured.

Crypto exchanges have an average of US$2 billion* in hacking losses. They are more attractive to hackers because of anonymity, irreversibility of transactions, as well as the rush and information chaos.

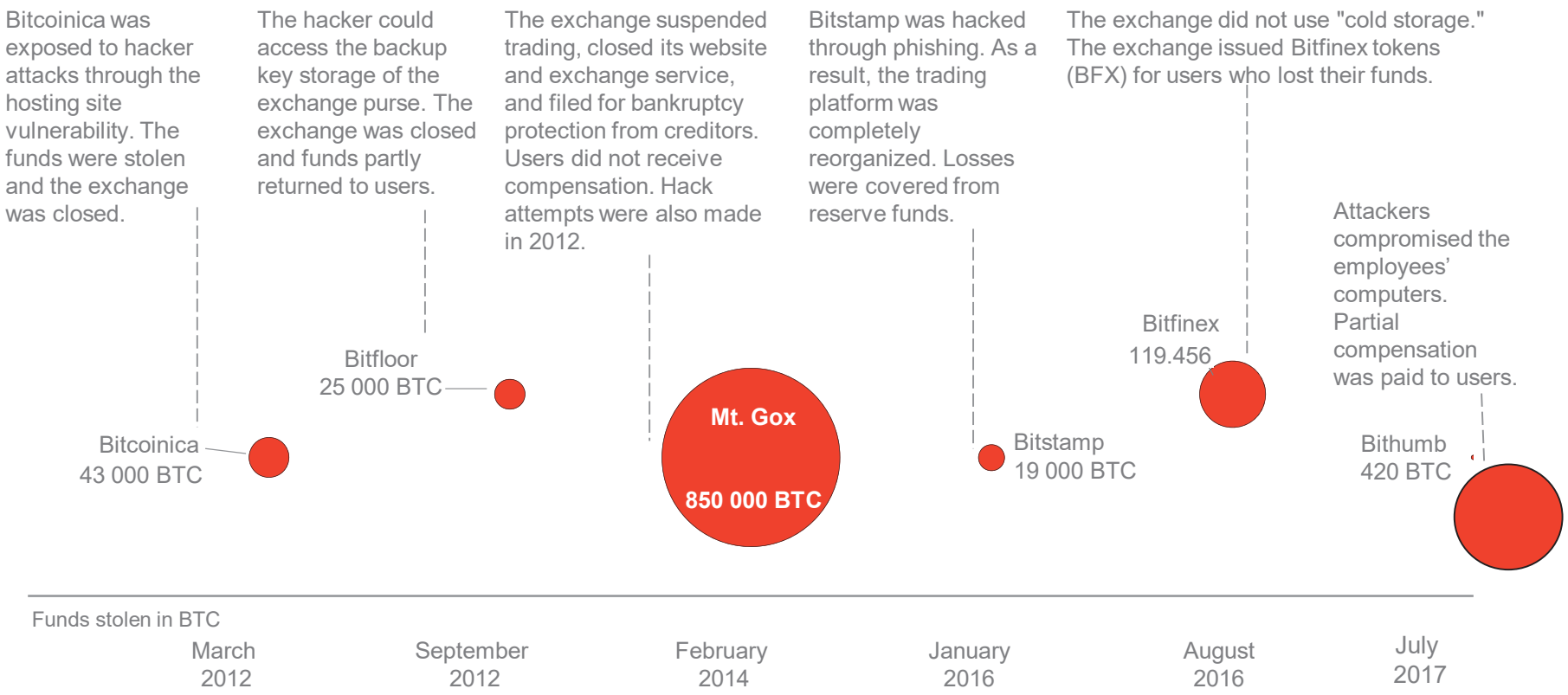
Loss of personal data

To trade tokens, large exchanges require full ID verification:

Most exchanges do not disclose policies and controls over personal data storage and use. This represents great value on the black market and chances of its misuse are high even without a breach.

Sources: EY, Group-IB
* November 2017

Security
Exchange hacking occurs regularly; the frequency of attacks is increasing



Source: EY analysis, Group-IB based on Securitylab, Vedomosti, Insider, company websites

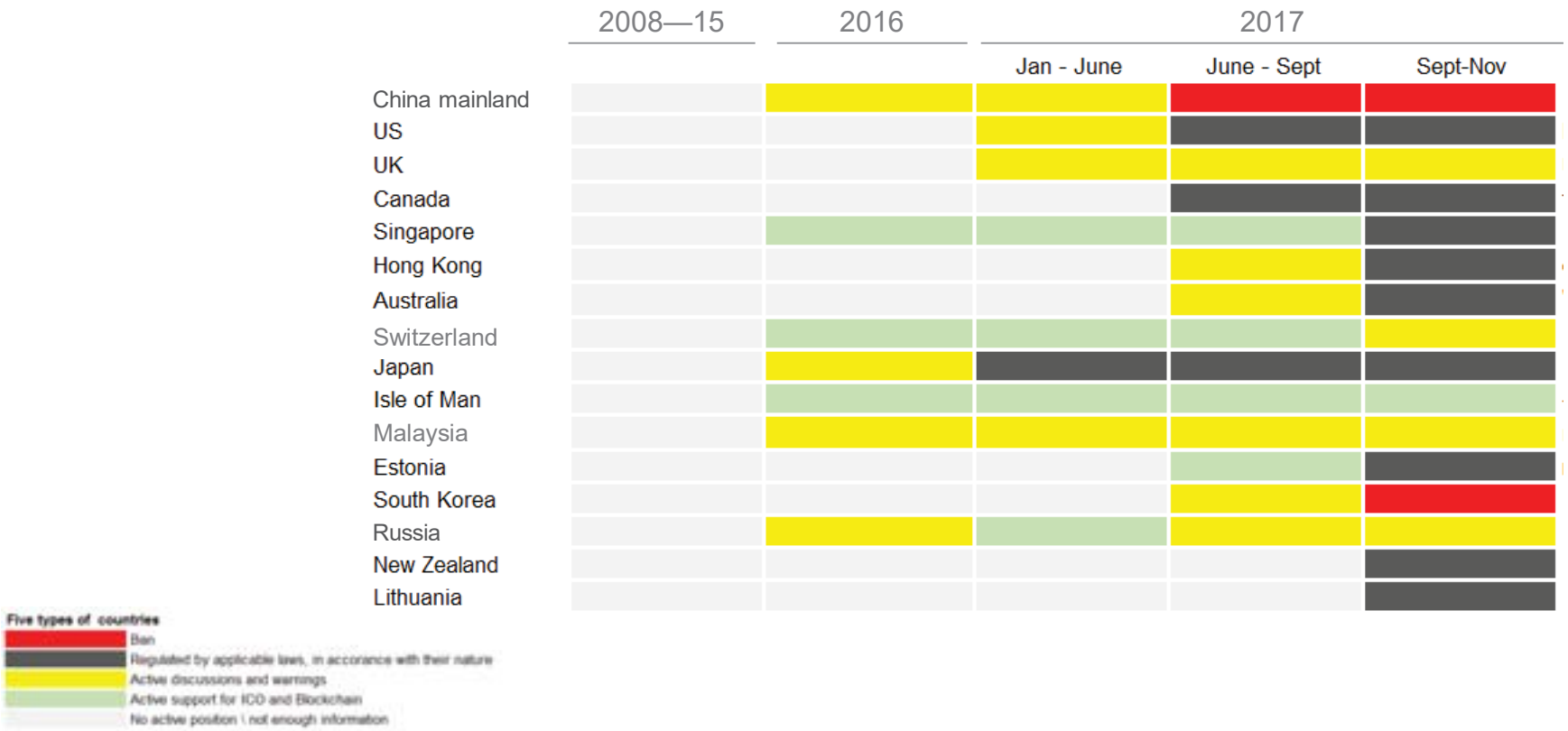
Regulation

Regulation

- **Most regulators move from ignoring ICOs to banning them or regulating them in accordance with the nature of the token**. But the interpretation of the nature of the token can vary greatly between countries: property, shares, right to claim, currency.
- **Industry players develop their own principles to fill in regulatory gaps.** One of the most notable is SAFT (Simple Agreement for Future Tokens), according to which investors receive an option until the utility token can actually be used as a means of payment.
- **Regulators are getting more active if there are signs of lawbreaking** in areas including currency control, securities, anti-money laundering, tax, personal data. The U.S. Securities and Exchange Commission has established a special cyber unit that has opened at least two cases on suspicion of ICO fraud.

Regulation
Uncertainty is a key risk

"Regulation is like a box of chocolate – you never know what you're going to get." ICO projects attract investments and plan activities far beyond a single country/region or legal jurisdiction. Most regulators move from ignoring ICOs to banning them or regulating them in accordance with token nature. But the interpretation of a token nature can greatly vary between countries/regions: property, shares, right to claim, and currency.



Sources: data from regulators webpages (ASIC, SEC, Bank KHP, SFC, CSA, MAS, Isle of Man's Department of Economic Development, SC of Malaysia)

Regulation
Market players are trying to introduce their own rules to the ICO market

May 2017

Simple Agreement for Future Tokens (SAFT)

The Investment contract between ICO organizer and accredited investor, developed by Protocol Labs. It offers options for the token purchase compatible with US law. The option is valid until the platform is started, then it is exchanged for utility tokens.

August 2017

Russian Association of Blockchain and Cryptocurrency

An association of developers, users and products of blockchain technology that promotes the spread and integration of blockchain into the country economy, and coordinates business activities of association members, as well as protection of their property interests.

September 2017

ICO Code of Conduct

The Crypto Valley Association (Switzerland) initiative to develop an official ICO code that will help to avoid risks and misconduct by ICO organizers.

ICO Governance Foundation (IGF)

An International organization with the purpose of protecting ICO investors and promoting the formation of ICO capital. IGF initiated a voluntary registration form for ICO (Form IGF-1). The foundation cooperates with national regulators (SEC, ESMA, CSRC, MAS) to create methods and standards for ICO regulation that complements existing regulation.

ICO Transparency Initiative

An initiative of 16 blockchain projects aimed at disclosing data on project-controlled wallets and explaining any costs exceeding 0.5% of collected funds.

October – December 2017

Token Alliance

A chamber of Digital Commerce initiative aimed at developing standards for the ICO as well as solving issues related to SEC regulation.

Initiative for ICO Regulation

Waves driven association that will develop standards for reporting, tax and accounting, compliance with “know your client” procedures, and various legal and regulatory aspects for the ICO and the blockchain industry.

Future actions

Future actions

- **ICOs have become a synonym for hype, unjustified valuations and excessive risk.** On the other hand, blockchain can increase project transparency, decrease investor risk and develop into an effective financing tool for quality blockchain projects.
- To achieve that, founders, investors and regulators need to:

Founders

- Provide clear justification for blockchain and own utility token
- Make the ICO process similar to IPO to balance token price
- Use transparent legal structure
- Ensure that funds and personal data are secured during and after ICO
- Ensure legal compliance not only in the country of registration, but also in all the countries where project operations and token use are planned

Investors

- Make use of public blockchain transparency for “advanced due diligence,” analyze the code of the smart contract and the platform, which should usually be available
- Invest "smart money”: avoid FOMO and look to contribute expertise in addition to simple financing

Regulators

- Link the “crypto” terminology to existing definitions (in limited cases, introduce new ones); ICO and blockchain are just new tools and should not be above the “legacy” law
- Standardize minimum requirements for reporting: public blockchain allows automated reporting and increased project transparency
- Protect the rights of utility token holders until this token can be used to pay for platform services
- Regulate the token turnover, including changes in token supply and functionality
- Cooperate with regulators from other jurisdictions, at least with jurisdictions with the largest number of ICOs and where most investors and crypto exchanges are located

Appendix


Last
Bid
Total
0.04
16.30
5.10
13.70
57100
197100
High/Low
Ceil/Floor

Definitions

Blockchain and ICO terminology is still a work in progress with no approved definitions yet. Below are the most commonly used terms for this research

- **Distributed ledgers:** distributed database stored on a set of nodes with records synchronized through consensus mechanisms.
- **Blockchain:** the most common consensus mechanism on distributed ledgers; it is often used as a synonym for distributed ledgers in general.
- **ICO:** initial coin offering, during which projects attract funds through the sale of digital tokens.
- **Token/utility token:** a proprietary digital currency of a blockchain project.
- **Smart contract:** program code with ICO conditions and token functionality.
- **White paper:** a public document with the description of an ICO project.
- **"Know your client" (KYC):** the procedure for confirming the identity of the token buyer.
- **Bounty program:** token distribution on special terms (most often discounts) to a limited number of early investors.
- **Public/permission-less blockchain:** anyone can become a member of blockchain.
- **Private/permissioned blockchain:** blockchain members and their rights are determined by an administrator.
- **Phishing:** cloning official webpages in order to lure user data.
- **Capped sale:** token sale in which the volume is limited and tokens are sold at a fixed price.
- **Uncapped sale:** token sale in which the volume is not limited and token price is established after an ICO.

Methodology

The ICO market is unregulated; there is no single source of ICO data, reporting standards or generally accepted methodology. We based our study on project websites, most popular crypto exchanges, ICO trackers, data aggregators and limited interviews.

For our approach, we:

- Collected data on 372 projects that have conducted an ICO (aggregate data from 2015-2017)
- Performed detailed analysis of the top 110 projects* that collected 87% of all ICO proceeds (2016-2017):
  - Token price dynamics from the date of ICO through November 24, 2017
  - Platform and token design: project white paper (project website), smart contract (Etherscan), reviews from dedicated social media and news sites
  - Product and token performance testing for selected blockchain platforms that were made available for public use
- Analyzed ICO blockchain network statistics, based on network monitors sites and third-party analytics
- Verified our conclusions against other public studies
- Held limited interviews with companies that have conducted/actively planning for an ICO (seven)
- Interviewed two independent tech consulting firms; ICO security sections are supported by data from Group-IB IT security
- For crypto exchange hacks, went as far back as 2012

Data sources:

Exchanges and data aggregators
- CoinMarketCap
- Coinbase
- CoinDesk
- Kraken
- Okex

ICO trackers
- TokenData
- ICOWatchList
- TokenMarket
- Coinschedule
- Token Report

Blockchain network scanners/platforms
- Etherscan (smart contract source code)
- Blockchain.info
- ETH Gas Station
- Bitinfocharts.com
- GitHub (project code)

Public ICO reports
- CB Insights
- Funderbeam
- Autonomous NEXT
- State of European Tech Report 2017
- Architect Partners

News sites
- CoinDesk
- ForkLog
- Anycoin
- Bloomberg
- Fortune
- Business Insider
- TechCrunch
- Reuters
- Forbes
- RBC
- ComNews

Dedicated blockchain social media
- Bitcointalk
- Medium
- Reddit
- LinkedIn (team profiles)

* Top projects by ICO proceeds as of the date when the ICO was closed

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