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The Crypto Ecosystem in China:

Between technological development and political restriction

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论文前言

全球经济正朝着日益数字化的未来发展。 几年前我们认为不可行的方式实现，现如今世界上经济载体的虚拟化已经是一种巩固的做法，尤其是与经济 - 金融交易界相关的。 当我们使用自动取款机，信用卡，支票或准备银行转账时，交易不会以现金转账而是以虚拟转账结束，这基本上涉及相同金钱概念的“计算机化”过程。 这无疑为比特币及它的基础区块链技术等虚拟硬币的诞生奠定了基础。这两个术语的使用方式通常以相同或互换的。出于这个原因，在这轮文的第一部分，我列出了比特币诞生的精确历史综述，以及对其基础技术的详细阐释，也就是说区块链。所谓的加密货币是该领域最成功的例子和实验，它代表了一个在新金融技术领域的真正转折点。加密货币的概念起源于 1998 年，但这要归功于一个仍然身份不明的人物中本哲史(Satoshi Nakamoto)，即数字货币开始采用一个非常明确的形式。 在这篇简短的引文中，我们试着找出让 Nakamoto 本人启发（我们不知道他是自己还是一个团队）实现 BTC 的主要灵感之一：

> *“如果我们能正确解释*比特币，*这对于自由主义观点非常有吸引力”*。
> *“Bitcoin is very attractive to the libertarian viewpoint if we can explain it properly”.*

当然，这种新工具的自由特性在其管理和传播模式中都立竿见影：由于区块链技术，我们可以由一个主体与另一个主体进行交易。因此，少了集中管理也就减少第三方，从而有可能匿名（这是主要成功因素之一），以及交易成本的降低。然后通过公共，分布式和加密的数据库允许和验证交易，该数据库名为区块链。

在这本论文，我们从技术角度着眼于比特币和区块链的许多方面，同时也更广泛地了解其历史和可能的应用。在比特币成功之后，其他形式的虚拟货币称为“山寨币”(Altcoins)出生了。它们已经能够达成一个很大的共识，尤其是在金融科技领域。 这种类型的山寨币的例子是由中国交易平台 NEO 的智能经济及其竞争对手 Ethereum(以太坊)开发的。如果比特币是经济交易的第一区块链平台，反而以太坊和 Neo 可以说它们是一个真正的虚拟机。在这两个虚拟机平台上你可开发智能合约 (Smart Contract)，促成，验证或执行，协商或执行合同的信息协议。

特别是 NEO，是一个“智能经济”平台（以前称为 Antshares），以及是在中国推出的第一个开源，加密货币和区块链分散平台。NEO 的加密货币已在最近几个

月的上升明显，大多数人也正是通过其爆炸性增长才了解的。但是，如果我们看看NEO的“弹药盒”，我们发现有很多有趣的方面。NEO常常被称为“中国以太坊”或“杀手以太坊”。很多加密项目必须全部使用它们自己的技术来解决问题。NEO旨在给予个体自主管理其资产机会，创造了一个“智能经济”的发展条件。这个平台，通过区块链和使用数字身份的，给用户机会在现实世界中数字化资产（资产可以是任何类型的商品），把它们变成电脑的数据。通过这种方式，将有利于他们的注册，储存，协商，抵账或清算。

比起比特币 以太币自2014年开发后流动的时间相对少很多。正如前面提到的，相比于比特币，以太坊的大新闻之一，是通过信任协议来建立双方的协议进而进行智能合同管理。此特性给予加密货币额外的运转使其成为企业和商家的理想工具。

一般的比特币或虚拟货币，已经有很大的潜力。特别是，许多专家强调比特币有可能会破坏国家货币垄断地位的难得机遇，为消费者提供不受央行控制货币形式。事实上，按照创始人的意图，这些虚拟货币是分散的，并可能成为一个主要竞争对手的法定货币。还有很多对比特币是否能长久的存在保持怀疑，他们觉得一旦用户失去对这种金钱形式的信任。

如今，全球有超过30家公司接受比特币支付。关于加密货币以及在不久的将来让它们成为官方交易手段的可能性意见有所不同。实际上，加密交易的手续费昂贵，缓慢，还有交易量有限并且耗能高。目前，加密货币不能在其当下状态成为大众交易方式。开发人员不断努力寻找新方法改进加密货币平台协议。

然而，从全球背景下，比特币以及加密货币还是缺乏明确的法律及税收的分类。 事实上，如果加密货币支持者继续增长，相关国家机构就立即对其要求规范。 一些国家已经开始采用不同的解决方案进行监管。

对此，中国似乎对加密货币持怀疑态度。它与比特币的复杂关系追溯到2013年，当中国银行意识到在国内比特币越来越受欢迎。2013年12月，为了警告投资者并强调由于货币背后缺乏的中央机构而导致的低安全性，中国政府与其他五个政府机构一起出台了一个“关于防范比特币风险的通知”。因此，所有的银行和金融机构不能执行加密操作， 另外提供比特币服务的所有公司要登记当局以防止洗钱，逃税，等。按照这第一个中国银行的通知，比特币是一个虚拟的产品，比如游戏积分。它可以进行交换但不能跟法定货币进行交换，也作为支付手段。

尽管政府决定禁止密码子生态系统，密码子生态系统仍在以超过 90%的全球交易量继续增长。 实际上，虚拟货币在第一波监管中幸存下来，因为许多交易员转移到货币合法的其他邻国（例如香港），或者试图规避系统和当局经常监控的中国网络。然而，在 2017 年，北京政府决定巩固它的密码学方面的限制性立场并禁止首次代币发行(ICO, Initial Coin Offering)一种使用虚拟硬币进行众筹的方法。政府最近采取的与加密货币有关的行动似乎是教育而非限制。

虽然中国对加密货币很反对，但另一方面，它对区块链技术很有感兴趣。事实上，中国是世界上最早提到国家级政策技术的国家之一：2016 年，区块链在“十三五”规划中被列为 2016 年至 2020 年国家发展的路线图。在这方面，阿里巴巴，微软中国和 NEO 等，一些重要的中国公司之间的众多合作已经启动，以使中国走向更加数字化的未来。令人惊讶的是中国政府与美国以太坊办事处的合作。事实证明，中国一直反对与非中国公司合作。显然，这表明中国将很快将自己作为世界强国加入这一领域。此外，一段时间以来，有消息传出政府希望放出其所有的加密币。如果是这样，这将改变许多机构和金融资产，打破美元的霸权地位。

所以论文结构如下:

本论文的第一部分分为三段。

在第一段介绍比特币及其基本技术中的区块链，分析其基础及组成元素。在第二段中，山寨币的广泛使用（比特币姐妹），重点是由中国加密货币 NEO 产生的生态系统，并将其与以太坊产生的生态系统比较，而不是与中国比较。第三章介绍了它的效用，功能和用途的初始硬币发行作为社会的基础上区块链技术中资金的手段。

第二部分，主要结构如下。深入思考为什么加密币生态系统在中国的蓬勃发展以及人们和初创企业如何走进加密币生态系统，从法律的角度翻译并评论的中国政府~~的~~两份函件，分析政府决定禁止比特币和初始硬币发行的原因和影响。

特别是，中国政府禁止加密货币和初始硬币发行的决定造成了许多含糊之处。例如，目前尚不清楚是否可以保留或生成新的加密货币或拥有或参与初始硬币发行。因此，为了克服这种模糊性并澄清这种误解，我们提供了详细的沟通分析。

在最后一部分，对未来中国区块链的一些项目进行了检查，提供了一些假设情景。特别是，分析在中国的生态系统之间 NEO 和以太坊与中国政府合作的可能，以及如果这项新技术将被集中~~和~~规范或将发行由中国政府国家加密货币发行将会发生什么的反思。

Chapter 1.

The development of bitcoin digital currency: the first blockchain

1.1 Foundations and elements of Blockchain Technology

In order to understand the development of the Cryptocurrencies ecosystem, it is important to analyze the growth process of the bitcoin[1] (the first Crypto) and its underlying Blockchain technology.

Different terms are widely used to define the Blockchain: Blockchain technology, Blockchain network, Blockchain infrastructure, Blockchain ecosystem, and many others. Even in the original scientific paper describing Bitcoin[2], written by 'Satoshi Nakamoto', the name used by its anonymous inventor, there is not a clear definition of the term.

For a while the Blockchain term has been confused or identified with digital currencies, with Bitcoin or with on-line payment services in general. In fact, the cryptocurrency is just one of many possible applications of the Blockchain technology; today it is widely used both as a technology to enable the existence of decentralized currencies such as Bitcoin (which can be exchanged by parties without the need of a central authority), as a platform for managing transactions and exchanges of information and data in a decentralized manner, and in different fields totally unrelated to finance and payment.

In order to understand the disruptive impact of Blockchain technology, we will introduce some key concepts, each highlighting one of the main aspects of the technology[3]:

1. Decentralization
2. Transparency
3. Safety
4. Immutability
5. Scalability

Each definition highlights main aspects of the Blockchain:

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[1] Since Bitcoin is both a currency and a protocol, capitalization can be confusing. Usually it is used *Bitcoin* (singular with an upper-case letter B) to label the protocol, the software, the platform and the community while *bitcoin* (with a lower-case b) to label units of the currency.

[2] *Bitcoin: A Peer-to-Peer Electronic Cash System,* Satoshi Nakamoto, 2009, available at https://bitcoin.org/bitcoin.pdf

[3] Mauro Bellini, *Blockchain: cos'è, come funziona e gli ambiti applicativi in Italia,* 2017, available at https://www.blockchain4innovation.it/esperti/blockchain-perche-e-cosi-importante/

- Decentralization. In information technology, a decentralized network, also called peer-to-peer network, is a system in which information is replicated and distributed on many nodes of the network, which are all of equal importance. Blockchain technology, in particular, takes advantage of cryptographic technology to decentralize the storage and the management of data and information, eliminating the need a middleman/third parties, that usually act as a guarantor in the network. For example, with this new technology it is possible to create decentralized currencies, self-executing contracts (smart contracts) and other smart property without the intervention of centralized institutions or organizations (e.g. banks). People and machines can collaborate through specific codified smart contracts by recording transactions on a decentralized register (or ledger), reducing operational costs. In other words, Blockchain technology makes it possible to create a network in which parties don't need a central authority to trust each other, and where it is possible interchange data, information or currency, in a transparent manner that is robust against misbehavior and other imperfections often present in current centralized systems[4].
- Transparency, in the blockchain field, can be described as the degree of clarity of information that the technology can provide. All participants can see everything at any time[5], such as transactions history and all the information stored, which allows toto solve any doubt about the flow of transactions and makes users aware of possible frauds.[6]
- As said before, Blockchain is a shared, decentralized, distributed and encrypted database with precise security rules. As the name suggests, it is a chain of digital blocks that contain transactions records. As every single block is linked to all the blocks before and after it, this makes it difficult to tamper with a single record because, due to the decentralized nature of the ledger, a hacker would need to change all the block containing that record.[7]
- The concept of immutability is often misunderstood or misapplied[8]. It is true that usually once data has been "written" on the major and most successful blockchain protocols, it is virtually impossible to change or modify it. However, a Blockchain is not immutable by

[4] Aaron Wright and Primavera de Filippi, *Decentralized Blockchain Technology and the rise of Lex Cryptographia*, March 20, 2015, p. 15-17, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2580664&download=yes
[5] Lisk, *Blockchain basics, Transparency*, available at https://lisk.io/academy/blockchain-basics/benefits-of-blockchain/blockchain-transparency-explained
[6] Stefania Stimolo, *Trustless, Transparency and scalability: new concepts of value*, May 7, 2017, available at https://medium.com/novamining/trustless-transparency-and-scalability-new-concepts-of-value-d5a65559e77c
[7] IBM, Curtis Miles, *Security by the blocks*, December 12, 2017, available at https://www.ibm.com/blogs/blockchain/2017/12/blockchain-security-what-keeps-your-transaction-data-safe/
[8] Gideon Greenspan, *The Blockchain Immutability Myth*, May 4, 2017, available at https://www.multichain.com/blog/2017/05/blockchain-immutability-myth/

definition. In general, it would be possible for a hacker to modify the content registered on a blockchain. However, successful blockchains are identically reproduced on an enormous number of computers, and because the nodes are distributed on many computers, a malignant attacker should take control of 51% of computers[9], which is an extremely unlikely scenario for highly successful and distributed blockchains.

- Scalability can be defined as a "model or function that describes its capability to cope with an increased or expanding workload or scope. A system that scales well will be able to maintain or even increase its level of performance or efficiency even if it is tested by larger and larger operational demands."[10] This concept can be applied both to telecommunications and IT systems and also to software and hardware engineering. Finally, it is ideal for Bitcoin and all cryptocurrencies. In fact, the system improves with the increase of participants' number. As the number of nodes increases, the transaction speed remains unchanged, but the risk of successful malignant attack is reduced, making the system more stable, safe and robust.

To these five fundamental concepts, two more can be added: the concept of trust and that of community. The final purpose of the Blockchain technology is to enable the creation of a decentralized community in which all parties can interchange data, information or value (e.g. a currency), being able to intrinsically trust each other without the need of a central authority. All these concepts and characteristics can create a powerful and complex new technology but also a democratic and supportive one.

To resume, without being too specific on IT details,[11] it is important to stress that through this technology it is possible to perform digital transactions on a decentralized P2P (peer-to-peer) network database where all computer nodes are equal and have the same privileges. This means that transactions can be made without a third party involved and they do not need to be supported by a centralized structure or verified by a central authority.

[9] Harsh Maurya, *Blockchain an Bitcoin are really immutable?,* available at https://it.vpnmentor.com/blog/blockchain-e-bitcoin-sono-davvero-immutabili/

[10] Definition available at https://www.investopedia.com/terms/s/scalability.asp

[11] *Securiting Video Integrity Using Decentralized Trusted Timestamping on the Bitcoin Blockchain*, Gipp, Kosti and Breitinger, 2016, available at http://www.sciplore.org/wp-content/papercite-data/pdf/gipp2016a.pdf

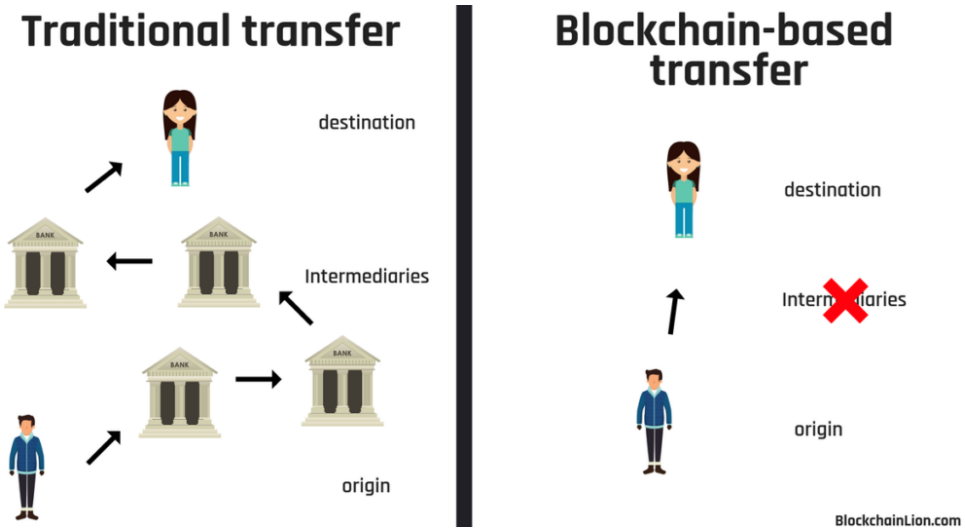

Fig. 1

Graphic representation of traditional transfer vs. Blockchain-based transfer[12]

Finally, an important distinction has to be made between

- Private blockchain (or Permissioned Ledger).
- Public blockchain (or Unpermissioned Ledger).

-Permissioned ledgers can be controlled by a subset of its users; when a new data item or a transaction is added, the approval system is not bound to the majority participants of Blockchain but to a limited number of actors that can be defined as *trusted.* This type of Blockchain can be used by institutions or by large companies that manage supply chains with a series of actors, companies that have to deal with suppliers and subcontractors, banks, service companies, retail operators, etc. Permissioned ledgers allow to define specific rules for access, modification and visibility of data. Technically, the permissioned ledgers are also more performing and faster than the unpermissioned ones, as they can operate without the need of implementing some specific protection mechanism that are instead necessary in public blockchains.

- A public blockchain (or unpermissioned ledger), on the contrary, is a fully open system where the access of new nodes cannot be restricted. On public blockchains anyone can participate to all the actions allowed by the blockchain. On bitcoin blockchain, for example,

[12] Blockchain Lion, *Blockchain and Government, can they work together?*, January 2018, available at https://blockchainlion.com/blockchain-and-government/

any node can access the list of past transactions and perform new ones, while on the Ethereum blockchain (that we will analyze later) any node can execute programs (i.e. lines of code instructions, also called smart contracts). Any party contributes to validation of data stored on the ledger and possesses a copy of the ledger, containing all transactions that occurred on the blockchain. A public Blockchain model prevents any form of censorship: nobody can prevent a transaction from taking place, provided it follows the set of guidelines and rules specified at the moment of creation of the blockchain. Public blockchains can be seen as a global database for all documents or transactions that need to stay unchanged over time, such as property contracts, economic transactions, or wills. The most common example of public blockchain is represented by Bitcoin, that we will describe with more depth in the next paragraph.

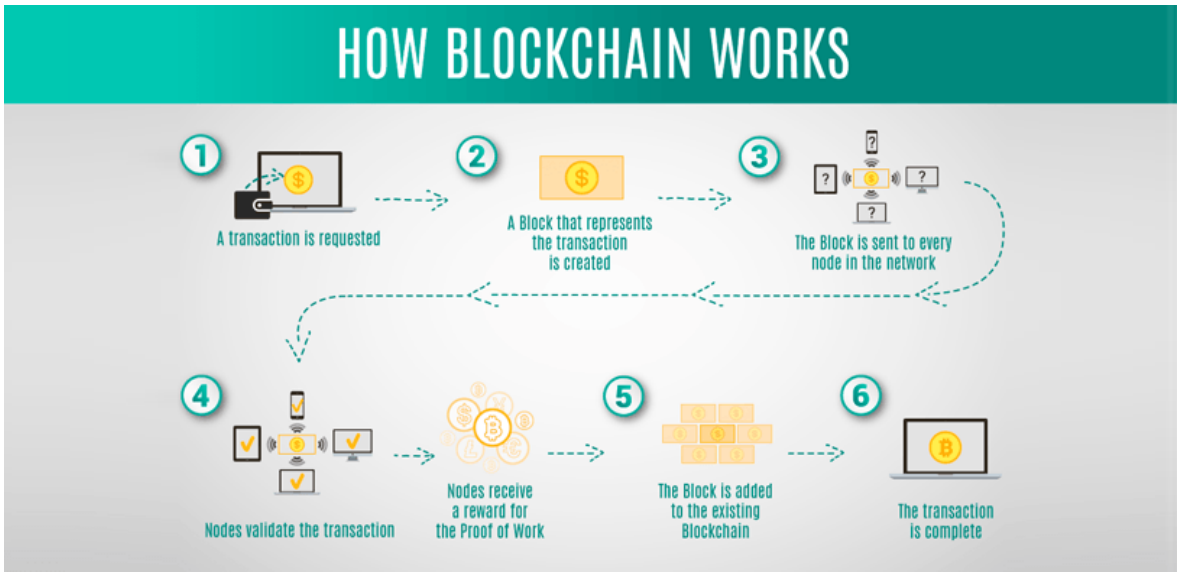

Fig. 2

Basic Understanding of Blockchain

The image above shows the exemplification of the graphic representation of how the blockchain works. In the first step there is the transaction, reporting all data and information (such as the receiver's public address, transaction information and cryptographic key), that represent value objects of the exchange. Then, in order to make a transaction, a block is created (step 2) and sent to every node/user in the network and so approved by them (step 3 and 4). Finally, when it is all checked and safe, the block is added to the chain of the existing blockchain (step 5) and the transaction is completed (step 6).[13]

[13] Available at https://www.zignuts.com/blogs/how-blockchain-architecture-works-basic-understanding-of-blockchain-and-its-architecture/

1.1.2 History of Bitcoin: the first cryptocurrency

Bitcoin was the main protagonist in 2017 and it is still object of debate in 2018, due to its strong speculation in the market. It has divided economists and financial market experts into two groups: those who describe it as "the mother of all bubbles"[14] and others that strongly believe it is already the future of impact investing. As market developed, Bitcoin has attracted the interest of many from all over the world who decided to invest in cryptocurrencies and today many entrepreneurs and companies use blockchain to create their own coin since it represents a *de facto* investment in their offer. [15] Bitcoin (BTC) is a "coin" made of bits. To be more precise, it is a cryptocurrency or one regulated by mathematical algorithms and it is called "electronic money" and/or "mathematical currency". The term Bitcoin with capital letter refers to technology and network, while bitcoin with a small letter (or BTC) refers to the currency itself.

The term Bitcoin appeared for the first time in the White Paper at the end of 2008 by an anonymous inventor (or a group of people), known under the pseudonym of Satoshi Nakamoto, entitled "Bitcoin: A Peer-to-Peer Electronic Cash System". In this paper Nakamoto describes, from a technical point of view, the way the Bitcoin works and how the distributed ledger concept operates.

Before Nakamoto and his Bitcoin, there have been several attempts to produce digital coins.[16]

"Blind signatures for untraceable payments" by David Chaum in 1983, is considered the manifesto of the digital currency. Chaum is, in fact, the first to lay the foundations of the principles that govern the cryptocurrency transaction today. He proposed the use of cryptography to validate a currency rather than protect it. The main purpose of Chaum was to create electronic cash, that is, electronic banknotes that maintain the same properties as the paper currency, such as non-replicability, non-traceability and the impossibility of spending it twice. While Chaum was working on founding the company Digicash, an electronic money corporation, the NSA (National Security Agency) banned the use of cryptography to the public due to "safety concerns". This happened because the Public key encryption was available to public and far from the control of NSA. From that moment the

[14] Professor Nouriel Roubini of New York University

[15] Joseph Green, *Are Cryptocurrencies the Future of Impact Investing?,* April 30, 2018, available at https://medium.com/datadriveninvestor/are-cryptocurrencies-the-future-of-impact-investing-8edece3b47d

[16] Marco Mione, *3*, *Storia del Bitcoin, della Blockchain e delle alter cryptocurrencies*, December 2017, available at https://it.fundspeople.com/news/storia-del-bitcoin-della-blockchain-e-delle-altre-cryptocurrencies

Cypherpunks movement began.[17] The term derives from the words cypher -the algorithm used to perform operations of encryption and decryption- and Cyberpunk -the artistic current born in the 1980 which has dealt with themes related to the reality of post-industrial societies (cybernetics, robotics, telematics, virtual reality, biotechnology, cloning) analogous to the punk movement or punk rock music.[18] The main battle of this movement became the defense of users' privacy, freedom of the network and access to technology as a route to social and political change. At the center of the defense of privacy there was clearly cryptography, classified at that time by the United States as an armament used in war and diplomacy. Thanks to new technologies, cryptography was available to people so the purpose of Cypherpunk was to develop cryptographic programs for all users who wanted to use it. In 1992 the "Cypherpunk mailing list" was started, a collection of names and addresses used by the cypherpunkers to send material or discuss cryptographic issues[19]. After two years the mailing list had 700 subscribers and was used as a tool to discuss the developments of cryptographic software whose basic idea was the defense of privacy. We still do not know if Nakamoto belonged to that list but many Cypherpunk ideas contained in the mailing list are now the foundation of the movement. For example, Bitcoin has inherited from the Cypherpunk movement the importance of anonymity, absence of central unit and open source design as it can be read in the paper written by the cypherpunk Eric Hughes in 1993:

We the Cypherpunks are dedicated to building anonymous systems. We are defending our privacy with cryptography, with anonymous mail forwarding systems, with digital signatures, and with electronic money.[20]

In 1996 an American company distributed and managed a digital currency, called *E-gold*, convertible into gold. *E-gold* started to grow in the year 2000 and in a short time reached a capitalization of two billion. Despite its rapid growth, in 2001 it closed due to the strict regulations on economic transactions and the continuous cyber-attacks to which the users of the company were subjected.

In 1998, the Chinese computer engineer and cypherpunk, Wei Dai, published a paper, "B-money, an anonymous, distributed electronic cash system", where he theorized an

[17] *Before Bitcoin: A history of Digital Money*, Feb. 2018
[18] Enciclopedia Treccani
[19] Cambridge dictionary, available at https://dictionary.cambridge.org/it/dizionario/inglese/mailing-list
[20] Eric Hughes, *A Cypherpunk's Manifesto*, March 1993, available at https://www.activism.net/cypherpunk/manifesto.html

untraceable decentralized network by which the senders and recipients of money were identified only by public keys and each transaction was digitally signed.[21] He was contacted by Nakamoto in 2008 and his paper was referenced in the subsequent Bitcoin whitepaper.

In the years 2000, the computer scientist Nick Szabo, another of the historical participants of the Cypherpunk mailing list, presented the project *Bit Gold*, which was not successful. He introduced the concept of proof-of-work and the concept of smart contract that even today is one of the major features of cryptocurrency.

In 2004 Hal Finney, a well-known cryptography professor, invented RPOW (Reusable Proofs of Work), a centralized payment system whose currency is based on a protocol able to verify, thanks to a cryptographic proof, that a computer has spent a certain amount of computational resources. The proof consisted in solving a cryptographic puzzle that was expensive and difficult to solve but easily verifiable. To produce it, Finney used Hashcash, the algorithm that the English researcher Adam Back presented in 1997.

The change occurred with Nakamoto and we can see this in the first three lines of the Bitcoin White Paper's abstract, the core of his project:

A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another ***without going through a financial institution.***[22]

Here Nakamoto introduces a clear development of a new concept of *trust*, and for this reason we can give to Blockchain a "political" role, as a platform or a technology that allows the development and implementation of a new form of democracy, distributed and able to guarantee everyone the opportunity to verify, control and have a complete transparency on transaction and decisions. Any transaction takes place only between two parties and without a third party acting as a guarantor. Indeed, the birth of Bitcoin has its roots in the philosophy of libertarianism. By the term Libertarianism we mean a form of thinking that recognizes the supreme good in the freedom of the individual. There are many branches of this philosophy, each of which gives a different definition of individual freedom. The individual is put at the center of society while the idea of community in the state remains apart. In the most extreme forms of libertarianism the state is completely absent and its guarantee functions are held by private individuals. The spontaneous cooperation of individuals will foster the free market. For these reasons, bitcoin seems therefore the perfect currency for the libertarian dream. In

[21] Wei Dai, information available at https://www.activism.net/cypherpunk/manifesto.html
[22] Satoshi Nakamoto, *A peer to peer electronic cash system*, page 1

fact, it is not imposed or controlled by the government, but it looks like a currency that transmits control from a third entity to individuals thanks to the distributed ledger. Because of Bitcoin, every user is a banker of himself and he can creates a new currency without the intervention of the state. Bitcoin, or the 'trust-free' money[23], allows the global economy to become free from central controls. Another aspect of Bitcoin is deflation, important issue for libertarians, who oppose the inflation perpetrated by the state seen as interfering in free market laws.[24]

Since the advent of the domain Bitcoin.org, which was registered in 2008, the cryptocurrency has grown exponentially. In 2010 bitcoin did not have a real value, we had to wait until 2011 when it reached the same value as the dollar. The first case of blockchain technology use was the purchase of a pizza that now is valued at 100 million dollars. 10k BTC were used for a $25 pizza.

In November 2013 bitcoin exceeded for the first time $1000. At the end of the year BitPay, a global bitcoin payment service provider, announced a new record of 10.000 clients and the first ATM bitcoin was opened. The firs website of on-line currency exchange was Chinese and it was called "BTC China".

A major increase in the interest in Bitcoin has occurred with the scandal of the Wikileaks, a non-profit organization, that has published embarrassing documents on the US government. Maybe the US government used its monopoly on currency as a weapon against Wikileaks. The government implemented an economic blockade to the site with the help of the main online payment systems -such as Mastercard, Visa, and PayPal- preventing donations in favor of Wikileaks. It became impossible for users to make donations, which denied the freedom of the individual and the market. The episode showed how a government with a currency monopoly could use that currency for purely political purposes. In this way, the independence of Bitcoin has made possible the end of this kind of control by the state and allows its use as an anti-censorship currency because, as we said before, unlike traditional payment systems, there is no central control that can prevent the entry of new users or block transactions.

Between 2013 and 2014, some events brought down the price of bitcoins from their historical high peaks.

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[23] Nigel Dodd, *The social life of bitcoin,* , December 2017, available at http://eprints.lse.ac.uk/69229/1/Dodd_The%20social%20life%20of%20Bitcoin_author_2017%20LSERO.pdf

[24] Primavera De Filippo, *Bitcoin: A regulatory Nightmare to a Libertarian Dream*, , May 2014, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2468695

In 2015, the interest of institutional investors and large companies towards Bitcoin and Blockchain technology increased, bringing the price of bitcoin about over $1000 per unit at the end of 2016.

2017 was, without doubts, the year of Bitcoin and ICO. It went through phases in which the price fell dramatically, losing $1.000/2.000/ 3.000 in a few hours and then rose again. The collapse predicted by many experts and economists has not yet occurred and this has attracted the attention of the whole world. As we can see in the graph, at the end of 2017 the BTC price reached $20000.00, its highest record so far.

Fig. 3

2017 Bitcoin price per month[25]

From mid-December 2017 bitcoin suffered a sharp decrease in value. The bitcoin fluctuations of the last two months of 2017 were determined by a series of negative news which led many investors to get rid of the virtual currency. In particular, February 2018 has been the worst month of the last three years due to the regulatory crackdown announced by several governments such as China, Korea fearing that bitcoins can be used in many illegal activities[26]. Early in February, another blow to the quotations of bitcoin (and other cryptocurrencies) was inflicted by press rumors that the leaders of Sec, the supervisory body of the US stock exchange, and the Commodity Futures Trading Commission would have asked American Congress to consider the possibility of a federal-level control of platforms for digital currency exchanges.

[25] Image available at https://coinmarketcap.com/

[26] Next Generation Currency, *Storia del Bitcoin,* , February 17, 2018, available at https://nextgenerationcurrency.com/la-storia-di-bitcoin/

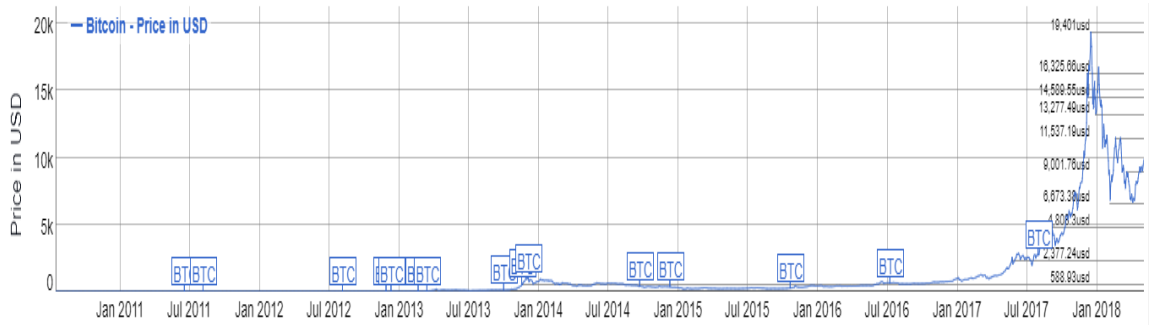

Fig. 5

Bitcoin trends and their prices from January 2011 to June 2018[27]

Today bitcoin payments are already accepted by companies such as Microsoft, Wikipedia, Badoo and other small businesses[28] and there are more than 10,000 places in the world where it is possible to spend them:

Fig. 6

Map of Bitcoin ATMs and stores that accept BTC payment - January 2018 latest update[29]

Bitcoins are used like a conventional currency such as euro, yuan, dollars, etc., but they differ in many ways: [30]

- Decentralization
- Limited supply
- Pseudonymity
- Divisibility
- Irreversibility

[27] Bitcoin Price in USD historical chart, average price, per day, USD, available at https://bitinfocharts.com/
[28] For a more detailed list visit https://99bitcoins.com/who-accepts-bitcoins-payment-companies-stores-take-bitcoins/
[29] Available at https://www.finder.com/who-accepts-bitcoin-united-states
[30] Noelle Acheson, *What is Bitcoin*, January 25, 2018, available at https://www.coindesk.com/information/what-is-bitcoin/

-The decentralization concept was used above to describe the Blockchain technology and it is the same for bitcoins; institutions do not control bitcoins traffic and this attracts more people who decide to spend and invest in it. Furthermore, bitcoin solves the 'double spending problem', through which digital asset can be copied and used again. In fact, this role is played by banks but with blockchain this function has been completely replaced.

-The supply of fiat currencies is limited by banks while the supply of bitcoin is controlled by an algorithm and cannot exceed 21 million BTC. If the limit of 21 million is reached, demands will increase while the supply remains the same; the price of bitcoins will therefore increase so as to make bitcoins more tempting.

-Bitcoin is often associated with the concept of anonymity because it is possible to send and receive cryptos without giving any personal ID information. However, reaching complete anonymity can be quite complicated because each user can be identified through the Bitcoin wallet or the computer address. Besides, each transaction is recorded and stored forever in the Blockchain. For this reason, Bitcoin is considered a semi-anonymous cryptocurrency where the element of semi-anonym is represented by the address at which a user receives bitcoin. [31]

-The smallest unit of a bitcoin is called *Satoshi*[32] (0.00000001 BTC) and this means that microtransactions can be made. For now, operations with current fiat currency would be impossible to make.

-Irreversibility. The blockchain allows to store all data in a shared and secure account book: the blocks, in fact, once approved, are unchangeable. This process is considered irreversible, that is bitcoins cannot be returned because the transaction cannot be modified. However, it is possible to cancel the transaction if it has not been mined and added to the blockchain yet. In this case, we have to wait for the transaction to be stored in the blockchain in order to be sure that the transaction has been completed so becoming irreversible.

Putting into practice these concepts means that once Bitcoin is installed on a computer or mobile phone, the Bitcoin wallet will generate the first personal Bitcoin wallet address linked to the user (who can used it only once) that can create other addresses whenever he needs it. The BTC wallet will be used to:

- keep BTC;
- transfer BTC to other users;
- receive payments (the are zero commissions);

[31] *Bitcoin Anonymity-Is Bitcoin Anonymous?,* available at https://www.buybitcoinworldwide.com/anonymity/
[32] *Definition of 'Satoshi'* available at https://www.investopedia.com/terms/s/satoshi.asp

- make payments;
- transfer BTC anywhere in the world without external controls and bureaucratic rules
- monitor \ reorder history of all transactions:
- make purchases online where bitcoin is accepted.

It is possible to process payments and invoices by oneself or use commercial services and deposit money in local currency or via bitcoin.

The price of Bitcoins is measured in relation to the fiat currency, for example the Euro (BTCEUR), the Chinese Yuan (BTCCYN) or the American Dollar (BTCUSD). What differentiates them from the fiat currencies is that there is no pre-established price, but the result of its value is based on different average flow rates from worldwide stock exchanges. The price is based on supply and demand, that is the meeting point between the buyers 'demand and the sellers' offer.

Before continuing, it is worth to briefly analyze the concept of mining.[33] The miners use computing power to ensure constantly, in a collective effort involving the resolution of cryptographic puzzles, that the decentralized Blockchain registry containing all the transaction cannot be modified by a malignant player. This process, called proof-of-work, consumes significant quantities of electric energy (with related economic cost). Therefore, miners must be rewarded with new bitcoins every time that a new verification of the blockchain is performed (in the Bitcoin Blockchain, currently 21 Bitcoins are given to miners worldwide every ten minutes).[34]

Since miners are so vital to the existence of the blockchain, it is obvious that most of the supply is controlled by the early adopters of bitcoins and miners. In fact, many early adopters were good or lucky enough to make money, buy and extract large amounts of Bitcoin before they reached an important value.[35] Miners produce an average of 1,800 BTC per day.[36]

According to the Chinese first investor, Jeremy Liew -Snapchat, and Peter Smith -the CEO and cofounder of Blockchain, the Bitcoin network will grow 61 times over the next 12 years and in 2030 it will represent 5% of the world's population. From 2013 to 2017 the

[33] Zibin Zheng, Shaoan Xie, Hongning Dai, Xiangping Chen, Huaimin Wang, *An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends,* June 30, 2017, available at https://ieeexplore.ieee.org/abstract/document/8029379

[34] School of Informatics, Indiana University, Debin Liu, L Jean Camp, *Proof of Work Can work*, March 23, 2006, available at https://www.econinfosec.org/archive/weis2006/docs/50.pdf

[35] To get a fairly complete picture of the situation I recommend https://www.bitstamp.net/ which is one of the most used bitcoin exchange sites for real money in the world while https://bitcoincharts.com/ shows the Bitcoin rating on all major exchange websites.

[36]Data available at https://www.bitcoinblockhalf.com/

network grew from 120 thousand to 6.5 million users with an increase rate that, if confirmed, will bring the share of Bitcoin users to 400 million in 2030. Although bitcoins inflation is high and prices increase, these elements indicate an extremely strong demand. There is a twofold explanation for this strong demand:

- bank blocks;
- fiat currency crisis.

As we have already said above, the banking block of WikiLeaks was certainly the first event that aroused the world interest in bitcoins or the banking block on Backpage.com[37], an online platform for people to advertise goods and services. As regards the fiat currency crisis, during the crisis in Greece, Cypriots invested in bitcoins. The bitcoin wallet was considered to be safer than a bank account so becoming a safer refuge in situations of geopolitical and economic risks. Another episode occurred in China when immediately after the Greek crisis, the government devalued the Yuan, and Chinese savers switched to Bitcoin to protect their wallet (Fig. 7).

Fig.7

Influence of Greek economic crisis on China[38].

Bitcoins are an experimental project and are a highly volatile asset. There are many negative price influencers, such as the legislative risk of a government ban or activities that severely regulate bitcoins or the emergence of a competitor that could count on the support

[37] *Rainey Reitman*, *Caving to Government pressure, Visa and Mastercard shut Down Payments to Backpage.com,* July 2015, available at https://www.eff.org/it/deeplinks/2015/07/caving-government-pressure-visa-and-mastercard-shut-down-payments-backpagecom

[38] Tyler Durden, *Bitcoin More than doubles 2015 Lows as chinese ignore easing capital controls*, 2015, available at https://www.zerohedge.com/news/2015-11-02/bitcoin-more-doubles-2015-lows-chinese-ignore-easing-capital-controls

of central banks or governments. These factors could make bitcoins losing market share in the future or have a strong impact in the cryptocurrency economy.
Despite the fact that bitcoins are considered the "mother of all cryptocurrency", in the middle of the year 2018, bitcoins reached the lowest level in comparison to the end of 2017, when it was $ 5,800. Although with some low and high peaks, bitcoins continued an uninterrupted descent that caused a collapse of about 70% of all quotations. Some motivations, that will be analyzed in the second chapter in detail, are linked to the Asia crypto market.

Clearly today bitcoins are the first but not the only cryptocurrencies in the market. Since its creation other alternative cryptocurrencies (generally referred to as *altcoins)* were born. They were realized (and new one are continuing to be introduced) after the success of bitcoin, and they often want to replace it by correcting any problems observed in the use of bitcoins. In the next paragraph we will see in detail how altcoins differ from bitcoin, focusing on two other altcoins: the Chinese Neo and Ethereum.

1.2 Altcoins: a focus on the Chinese NEO and the Ethereum ecosystem

1.2.1 General features of Altcoins

Bitcoin is undoubtedly the "mother" of all cryptocurrencies and the reference model in this field. But today there are several hundreds of cryptocurrencies in the world that aim at having characteristics that Bitcoin, even with all its advantages, does not have. For example, many *altcoins* pay more attention to different aspects such as privacy and security. Before defining what altcoins are, a distinction between altcoins and tokens has to be made. In general, we can say that, compared to a crypto coin which just represents a mean of payment, a token presents different additional properties.

-Tokens are a digital representation of any asset (equity token) or function (utility token) issued by a dApp (decentralized application) normally built on another blockchain. Besides giving the possibility of launching an ICO (Initial Coin Offering- we will see it in the next paragraph), the dApps has all the blockchain advantages, such as guarantee anonymity to users and decentralized networks, and does not refer to a single central server on which to rely, etc. If compared to coins, tokens do not need to build a chain of blocks. In fact, by using templates prepared from the main blockchain, much less burdensome tokens can be released,

which are also faster than a normal coin. Today, most tokens are generated by the Ethereum platform. We can distinguish 3 classes of Tokens:[39]

• First-class tokens correspond to digital coins and can be transferred among parties by performing transactions into a given blockchain. This type of token does not confer rights towards a counterpart but has only the function to register a property right of the token. An example can be Bitcoin, Litecoin, etc

• Second-class tokens give owners the right to act against the person who generated the tokens or against third parties. Some example could be:

a) Tokens for payments of specific amounts; In this case the owner has the right to receive a payment of a specific amount.
b) Tokens for future payments; gives the right to receive future payments, according to certain conditions.
c) Tokens for the provision of services or the receipt of goods and intangible good; the holder has the right to receive a certain service or goods from the issuer or a third party that has entered into commercial agreements with them.

• Third-class tokens have a mixed function, as they represent a property but also confer different rights, such as voting rights, economic rights, etc. Who owns this type of token cannot exercise a right against the issuer of the security or a third party.

- The *altcoins* are the alternative cryptocurrencies created after the success of the Bitcoin, replacing, exploiting and correcting any problems found in the use of bitcoins. Almost each coin has its own underlying Blockchain, presenting a set of properties that differentiates it from the Bitcoin Blockchain in terms of speed, governance rules, blocks structure, optimal areas of use, and so on.

[39] Massimiliano Nicotra, *ICO Initial Coin Offering: una ricostruzione giuridica del fenomeno*, December 2017, available at https://www.blockchain4innovation.it/esperti/ico-initial-coin-offering-ricostruzione-giuridica-del-fenomeno/

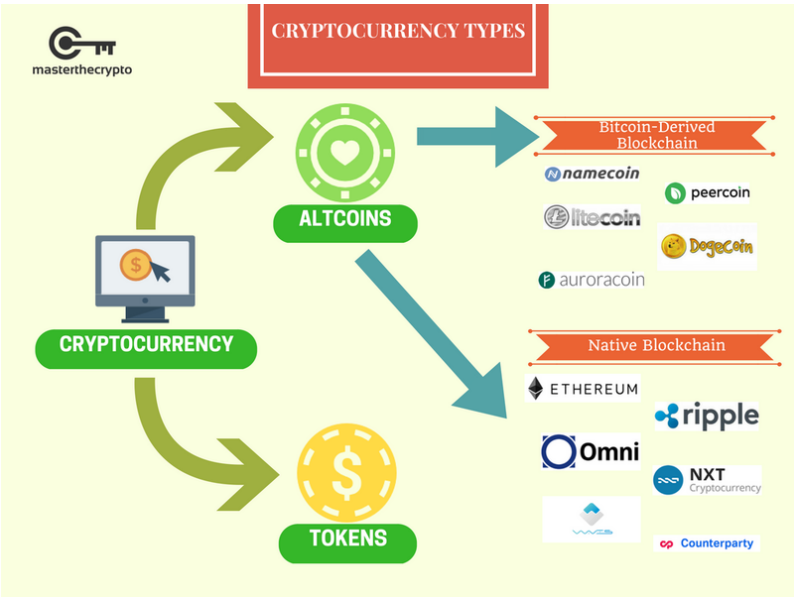

Fig. 8

Types of Cryptocurrencies[40]

Not all altcoins use a peer-to-peer technology and may sometimes require a mining process to validate the related transactions. Following the success of bitcoin, the world of altcoins has developed very rapidly in the last years: there are currently hundreds of them, so it is difficult to study them in a thoughtful manner and determine which ones actually solve specific market needs.

Usually altcoins are evaluated following these three different aspects:[41]

- Increased technological details development margin compared to bitcoin;
- The lowest market price compared to bitcoin;
- The degree of popularity.

Considering the great volatility of the cryptocurrency, it is impossible to establish a permanent ranking of coins. Market capitalization is the most important index available to understand how the cryptocurrency moves in order to find the best one to buy or which currency to invest money in. The price can change even during the day. For this reason, the first ten coins will be listed, based on the market capitalization of the last months (fig.9):[42]

[40] *Differences between cryptocurrency coins and tokens*, December 2017, available at https://www.ziynet.org/money/differences-between-cryptocurrency-coins-and-tokens_58.htm

[41] Ada Ivanova, *What You Need to Know About Altcoin*s, March 21, 2018, available at https://www.maketecheasier.com/what-you-need-to-know-about-altcoins/

[42] https://coinmarketcap.com/

Name	Symbol
Bitcoin	BTC
Ethereum	ETH
XRP	XRP
Bitcoin Cash	BCH
EOS	EOS
Litecoin	LTC
Stellar	XLM
Cardano	ADA
IOTA	MIOTA
NEO	NEO

Fig. 9 [43]

In the next paragraph we have chosen to analyze the Neo and Ethereum ecosystem for two main reasons:

- Ethereum can be considered a conceptual upgrade with respect to Bitcoin, as in addition to the registration of economic transactions it represents a platform that can host a new form of software and programs, storing all the changes of states of those programs into the blockchain.
- NEO, born recently, wants to become the biggest competitor for Ethereum. The goal of the creators of the NEO is to create a network that can help the smart economy to substitute the traditional economy. The main advantage of NEO compared to Ethereum is the use, to ensure the integrity of the blockchain, of proof-of-stake, which is energetically much less expensive if compared to the proof-of-work method currently still used by Ethereum
- Ethereum and NEO are now becoming competitors in China. This aspect will be later analyzed in the third chapter of this dissertation.

[43] Ethereum charts available at https://coinmarketcap.com/currencies/ethereum/#charts

1.2.2 The Ethereum Ecosystem: more than a cryptocurrency

Ethereum is a decentralized Web 3.0 platform that allows to run peer-to-peer smart contracts (essentially software programs). It was founded in 2013 by Vitalik Buterin, a Russian-Canadian programmer from Toronto, who in 2011 became interested in Bitcoin. Buterin proposed to build a new system based on a blockchain called Ethereum, easy to understand and complemented by a coding language that allows to run, in a decentralized manner, any kind of software programs on top of the Ethereum Blockchain.

During the first two weeks of crowd sale, Ethereum sold 2,000 Ethers for the price of a bitcoin though the price increased later on. Ethereum, in fact, was born from an ICO (Initial Coin Offering, a fundraising project) in August 2014. While Bitcoin was $ 600, each Ether was worth just $ 0.30. The crowd sale lasted 42 days, collecting more than 31,000 bitcoins (US $18.4 million).

At the beginning of May the price of Ether reached $ 77 - an increase of 25.567% if compared to the initial price. As typical in the world of cryptocurrencies, the price of Ether has been extremely volatile since Ethereum went live in 2015.

In June 2016, a hacker managed to exploit a bug lying not on the original Ethereum protocol, but on a decentralized application built on top of it called DAO (Decentralized Autonomous Organization), a form of investor-directed venture capital fund. The hacker temporarily stole $ 50 million in Ether that belonged to those who had invested in the DAO project. After a month of debate, the Ether community was split in two: one faction (the majority) was in favor of a change of the original Ethereum blockchain protocol to “go back in time” on the blockchain and return funds to their legitimate owners, while another minor but non-negligible faction argued that modifying the original protocol was contrary to all the blockchain rules about immutability and that “code is law”, meaning that any exploit of the code features, however buggy, represented a legitimate action on the blockchain. In the end, the Ethereum protocol was actually modified to reverse and neutralize the hacker’s actions, but a high cost: the price fell by 50% in 48 hours, and the minority refused to accept the change, staying instead on the old version of the protocol and giving rise to Ethereum Classic.

In 2017 many startups started to use Ethereum’s platform to launch their own ICO. When these companies began to have success with ICOs on Ethereum’s platform, the value of Ethereum coin started to increase exponentially. In July it reached its top of $400. About the end of 2017, a lot of investors were able to have great advantages from the year’s rapid rise.

In the first half of 2018 Ethereum recorded heavy losses compared to the US dollar. As always, when the price of bitcoin falls, the cryptocurrencies altcoin follows its trend. In fact, by analyzing the list of the first 100 digital currencies, it is possible to verify that after the price of bitcoin fell by 5%, all of them were suffering losses. Some analysts attribute the decline to the fact that the US CFTC (Commodity Futures Trading Commission) has requested Coinbase, Bitstamp Kraken and itBit to provide trading data after the launch of bitcoin futures (bitcoin-based securities). The 5% decline represents a very negative signal since the market could now accelerate downwards by expanding losses even further until the price reaches a valid support able to bounce the prices.

Today (July 2018) Ethereum has a market value of $44.406.923.693 USD (6.936.525 BTC) and since 2015 (such as the others platform) the price has suffered high and low peaks.

Fig. 10

Ethereum Market Capitalization from November 2015 to July 2018. The yellow line represents price in BTC, the green line the price of USD while the blue line is the Ethereum market capitalization with both Ethereum and US dollar in the same line. [44]

1.2.3 Technical aspects of Ethereum

Ethereum has similar functions to Bitcoin with the main difference that Ethereum Platform can be used to perform many other operations. In fact, Ethereum is the first decentralized virtual computer in the world, and it is not physically located somewhere in the world but only in the network. It is made up of all the computers that participate in the Ethereum network but at the same time it is autonomous from these. An example is the possibility of using smart contracts, programs which define a series of proceedings that the

[44] Image available at https://coinmarketcap.com/currencies/ethereum/#charts

user can start in order to bring the programme to the next step. It can be exploited for a huge amount of transactions and operations including domain registration or crowdfunding platforms creation, it could be used in the field of intellectual property, electoral systems, financial markets, crowdfunding and much more. The potential of Ethereum focuses in the IoT (Internet of Things) sector, expression that define the network of equipment and devices and computers, connected to the Internet such as cars sensors, radios, air conditioning systems, but also cameras, furniture, containers for the goods transports. Any electronic device equipped with software that allows it to exchange data with other objects connected. Ethereum technology will allow the interaction between everyday systems. For example, autonomous vehicles may need to share with other vehicles or other monitoring systems, not only their position but also data such as energy efficiency or the number of passengers in the car. Thanks to the Ethereum technology will be easy for vehicles to exchange these kinds of information.

Ethereum has the native token Ether and the pricing value GAS that can be easily confused but actually have different functions:

-Ether is the currency of Ethereum and it has two main functions:

1. It rewards the miners of the network during the competition for the creation of new blocks;
2. It allows the realization of decentralized applications within the protocol Ethereum and their functioning.

As bitcoins can be divided into Satoshi, also the Ether can be subdivided into smaller parts, too: finney, szabo, shannon, babbage, lovelace and wei.

-Gas could be defined as an internal unit of account for the Ethereum Network. Every action taken on the Ethereum blockchain (such as transactions) must be paid in a certain quantity of GAS. The GAS is bought in ether with a market mechanism, so its price is chosen by the consortium calculating the average among all the transactions which occur in the network, as well as the waiting time for the block to register the transactions. The longer the code to write the transaction, the more Gas you have to pay but you have more opportunities to be mined first, so your transaction can be validated and added to the block. This mechanism is the guarantee of the Ethereum Blockchain to make Smart Contract more efficient. So Gas can be described as the fuel of Ethereum or the internal price for making a transaction or contract on the blockchain.

Compared to other computational platforms, the Ethereum is adopted by thousands of users around the world. If this makes the mechanism of calculation on the cloud less efficient, on the other hand, it allows to track all the results obtained in the currency blockchain, so that all users have all the information of other users at their disposal. No user has the power or the possibility to modify or stop a process or program started on the platform. The system adjusts itself, without external interventions, and this also makes smart contracts safer and more convenient. In fact, when running on the blockchain, a smart contract becomes a standalone program, executed automatically when certain conditions are met. When some smart contracts are executed on the blockchain, they proceed exactly as they were programmed without any censorship or interruptions, fraud or interference from third parties. Ethereum allows developers to create all the operations they wish. For example, they can build thousands of different applications. The smart contracts provide that none of the two or more parties involved (the contractors) can modify it in any possible way. This form of guarantee is the biggest advantage offered by the system and offers lots of fields of application. Two contractors from two different countries can draw up a contract without having legislative competences of their respective countries of origin. None of the two contracting parties can cheat each other. If the traditional legislation does not count for anything, the smart contract stipulated in the cloud will represent the sufficient guarantee for the contractors. Finally, neither corruption nor crime can in any way affect trade relations. In short, Ethereum is not only a means of payment like Bitcoin, but also a tool to stipulate contracts through its platform, useful to offer new possibilities and freedom to anyone.

1.2.4 NEO and the state of the Smart Economy

NEO, the first Chinese open source blockchain, appears to be the most fearsome competitor for the Ethereum (called also “Ethereum Killer”) as, according to experts, it is extremely similar. The objective of the creators of the NEO is to create a network where the smart economy can succeed in supplanting the traditional economy (such as IoT). Founded in May 2014 by the two Chinese entrepreneurs Da Hongfei and Erik Zhang, its name, Neo, derives from Greek (which translated means *new*). Until 2016 it operated under the name Antshare and then they rebranded the name. NEO's mission was to revolutionize the way it trades, managing the transition from the traditional economy to a smart economy, based on technology. The founders of the Neo cryptocurrency decided to create for the first time this network, platform and cryptocurrency, starting from the idea that technology is able to bring progress by changing the future thanks to the so-called "smart economy". As stated by

Hongfei, with the term smart economy we mean "intelligent economy" or the process which is able to make an idea become reality through technology. The founder himself, believes that in ten years' time all assets will be digital. NEO was born to be the right platform to achieve all this. In fact, NEO manages digital assets through smart contracts in a more efficient way than other platforms and digital identities through the payment in cryptocurrency. Moreover, Neo founders are trying to cooperate with the Chinese government and this could be an important point in favor, because for the first time there would be a platform supported by a such a big and important government as the Chinese one. This aspect will be analyzed in detail in the third chapter.

1.2.5 Technical aspects of NEO

As we said, Blockchain technology provides a decentralized, non-manageable, highly reliable Smart contract. Instead, the NEO Smart Contract 2.0 includes features of certainty, high performance and expandability. So validation, function and application contracts are included. As far as its performance is concerned, NEO (as Ethereum) uses NeoVM (Virtual NEO Machine) for contract execution. This allows contracts to start very quickly and requires a small amount of resources. It is also suitable for smart contracts as well as short procedures.

The characteristics of Neo platform are: [45]

- No more than 15 million Neo coins per year can be mined, in order to avoid inflation.
- Microsoft and the Chinese giant Alibaba are partners of the platform in order to support the NEO brand.
- In order to support the platform, a global investment fund called NEST FOUND was created.
- The languages currently supported are C #, VB.Net, F #, Java, Kotlin. While the languages soon available will be C, C ++, Golang, Python and the JavaScript one. With the support of many languages, more than 90% of developers can participate in the development of a NEO smart contract without having to learn a new language.

NEO, as Ethereum, has the cryptographic token NEO and the NEO GAS (before it wass called Antcoin ANC).

[45] NEO information available at https://en.bitcoinwiki.org/wiki/NEO#Technical_characteristics

-The NEO token acts as a coin investment in the NEO blockchain. It has a hard cap[46] of 100 million tokens that will be used for building blocks, network management, network changes and other activities.

-The NEO GAS token also has a limit of 100 million hard caps and, as Ethereum, it has the purpose of acting as a "fuel" for the NEO blockchain. With an issuance cycle that will last for a total of 22 years, GAS is used to allocate resources and to cover network charges for various operations, including integrated services (such as the implementation of DApp and smart contracts) and support for the maintenance of the blockchain.

Today (July 2018) NEO has a market value of $ 2,247,901,500 USD (350,760 BTC). Unlike other ecosystems, since the platform was launched in 2016, the price has risen steadily (as we can see in the figure) especially when compared to the BTC price.

Fig. 11

Neo Market Capitalization from November 2016 to July 2018. The yellow line represents price in BTC, the green line the price of USD while the blue line the Neo market capitalization. [47]

1.3 Utility, Functions and purpose of the ICO

1.3.1 ICO as the evolution of the IPO

The ICO, or the Initial Coin Offering, is a form of fundraising used by startups or by entities who want to achieve a specific project, made possible through blockchain technology. An Initial Coin Offer can be considered the evolution of the IPO (Initial Public Offering) but it differs from it for certain characteristics.

[46] *Hard cap* is the maximum amount of money/capital a cryptocurrency can receive from investors in its ICO.
[47] Image available at https://coinmarketcap.com/currencies/neo/#charts

-The initial public offering of equities is the way through which a company for the first time put its stocks on the stock exchange, offering them to investors. This happens when a company expresses its willingness to be listed on regulated markets. The company that promotes an IPO can collect liquidity from the primary market through different methods:

• Bookbuilding IPO. Provides prices range through the demand expressed by institutional investors.

• Fixed price offer.

• Auction. A public offering where the stock is sold to the highest bid.

• Hybrid. A combination of those indicated above (such as IPO in China).

However, timing and modalities of an IPO are not so immediate and simple. After optimizing a strategic choice in how to make the offer, the company must receive the permission from the stock exchange authority to access the primary market, observing certain terms and conditions. Then, it will be necessary to identify an intermediary in charge that promotes the offer and maintains relations between the company and potential investors. Finally, as a result of various negotiations, the number of shares and the corresponding price to be offered will be specified. Besides long period of time, in order to proceed, the company will have to face several direct and indirect costs, including the fee for the intermediary that guarantees the offer.

- ICOs can be expressed as the sum of crowdfunding and the lever of blockchain technology. It is a collection of cryptocurrencies (depending on which coin the company receives, usually more than 90% of companies use Ethereum) in which investors, interested in the project, receive in exchange Tokens (or titles) that have (or at least should have) a utility function. The transactions are verified and completed via smart contracts.

The start-up that promotes an ICOs can raise capital from the market issuing a token. According to the quantity requested, the initial coin offering is divided into different rounds, which are often called pre-sale and sale. Depending on how much liquidity is collected during the initial rounds, the start-up will decide whether to continue with the sale or block the offering.

In general, we can identify three types of ICO:

1. High impact projects with long-term road maps;

2. Projects with starting communities that develop a series of services that can be useful for the users themselves;
3. One or a group of people think of an idea that they will then propose in the market.

The methods and timing with which a start-up collects capital are decidedly simple and schematic:

- Announcement of the ICO
- Creating the Whitepaper
- Getting one or more advisors on board
- Token creation
- Advertising campaign
- Holding the ICO
- Using the tokens
- Product development

After the company has announced its intention to launch an ICO, it will attract the attention of the community. Then the company will publish its business plan (or white paper) in various digital platforms and the project will be viewed by those who are interested. Afterwards, tokens will be created and offered by the company through crowd sale events. During the first pre-sale, the coin is quoted in the virtual exchanges in order to be then exchanged with other coins or Fiat currencies. Normally it is very common to offer bonuses to those who first buy tokens. Once the ICO has been launched, investors send their money in exchange for tokens projects. Finally, the company uses the money that were collected during ICOs to build their projects. The more money will be collected the more quickly companies can develop their projects. On the other hand, if ICOs time-scales are short, on the other hand costs will be high, especially those related to communication and marketing.

It is important to remember that every ICO is different and works differently. This is why an investor must carefully read the White Paper of each project, check the internal rules and check which coin the company accepts.

1.3.2 ICO: Pros & Cons

Here is a list of the main advantages:

- Extension to a global market. Unlike traditional IPOs, capital raising can come from every part of the world, without geographical, geo-political and temporal limitations. In addition, the coins will be traded on virtual platforms open 24 hours a day, in which there is no law governing buy-sell processes of the asset.
- Speed of execution.

There is no time limit. The process eliminates a bureaucratic and managerial downtime, giving every start-up the possibility to obtain fast liquidity.

- Open to non-institutional investors.

The market becomes accessible to everyone. Every free citizen who has access to the internet can freely buy or sell his virtual property.

- Absence of intermediaries.

In the process of matching demand and supply, the only actor is the company or the start-up. There is no longer the need to find an intermediary that connects ventures capital or institutional capital and projects.

Based on the events of recent years, the cons are:

- Limited control.

The initial phase of ICOs gave the possibility to everyone to exploit this phenomenon. However, in the absence of guarantees for the consumer, many projects turned out to be unsustainable or even worse, a bribe. On the other hand, IPOs can give the potential investor more certainty and protection.

- Excessive access to capitals.

The ways a start-up can access capitals are relatively automatic. The presence of a business plan is sufficient to drain liquidity towards the project, without a real analysis of cost-opportunity by the consumer.

- Internet attacks.

Phishing attacks and ransomware are often carried out by hackers to steal coin holders and up to now no protection is conferred by any authority.

1.3.3 Some Data

Since 2013, the year in which the first ICOs were launched, crowdfunding activities have increased exponentially. In 2017, the year of the ICOs boom, according to Tokendata, a platform publicly available data (qualitative & quantitative) on token sales, more than 5.6 billion dollars of capital were raised (435 tokens), a substantial increase if compared to 2016 that was of 240 million dollars.

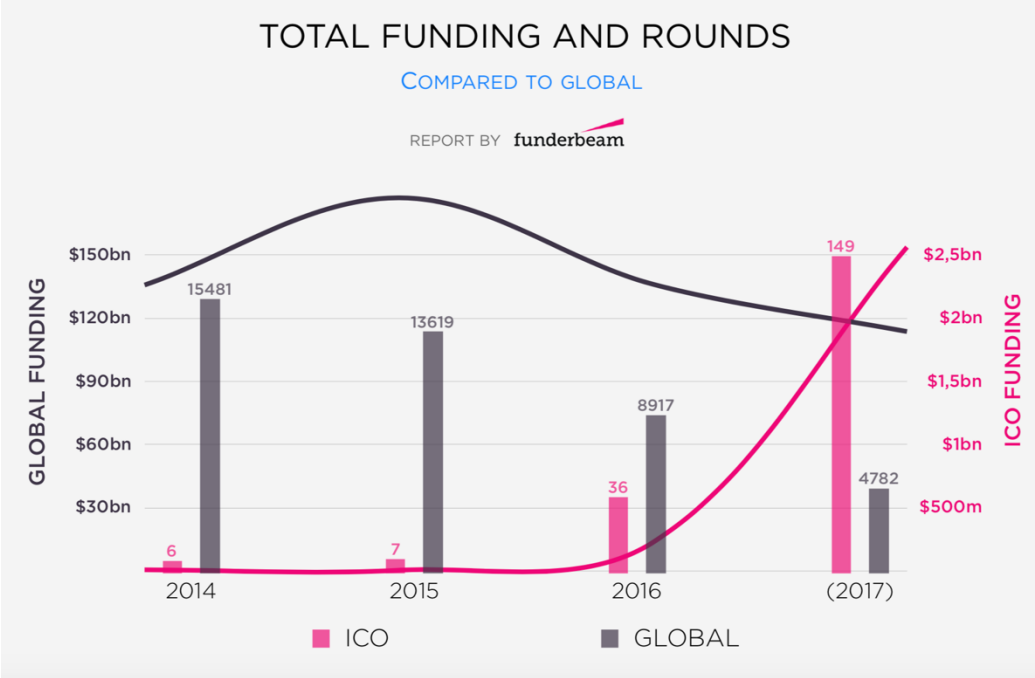

Fig. 12

The grey bars show the numbers of startups who launched an ICO from 2014 to 2017 while the pink bars show the total ICO collected. The grey line shows global funding from 2014 to 2017 while the pink line shows ICO funding. [48]

[48] Funderbeam, *Initial Coin Offerings Funding Report*, 2017 p. 3

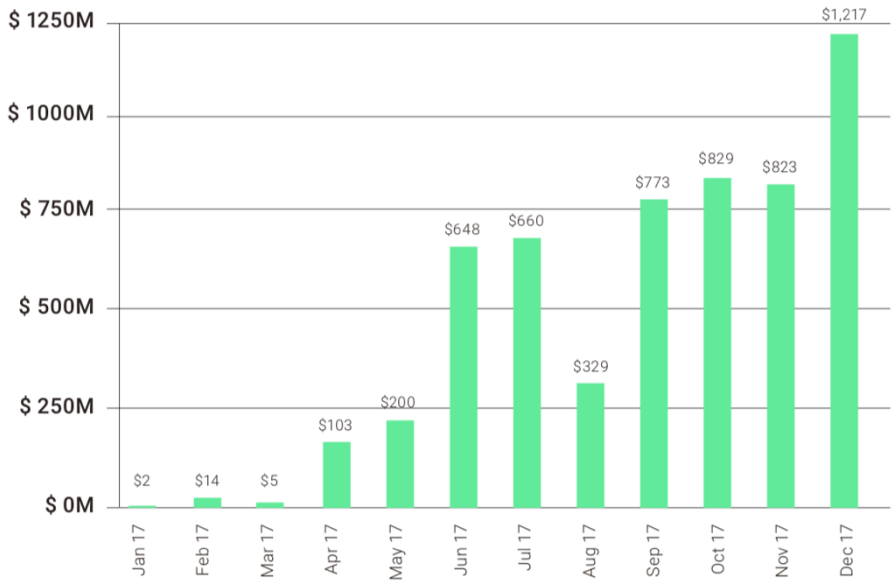

Fig. 13

Monthly totals USD raised by ICOs in 2017[49]

However, of these ICOs launched, only 48% were successful, especially in the Blockchain, Finance and Payment sectors. Because of the many bankruptcies and frauds that have occurred, many countries started to introduce specific laws to regulate the phenomenon.
In many countries, this phenomenon is now subject to verification (Canada, Israel), in other countries it is completely friendly (Switzerland) while in others has been (perhaps only temporarily) banned (China and South Korea).

1.4 Cryptocurrencies and Governments

Bitcoin, or cryptocurrencies in general, have numerous potentialities. In particular, many experts have stressed the extraordinary opportunity that Bitcoin represents to undermine the money state monopoly, by providing consumers with a form of money not controlled by central banks. Bitcoin is a cryptocurrency created by the market and decentralized (according to founders' intentions), which could become a big competitor for legal currencies. There are also some skepticals who deny the possibility of Bitcoin to work in the long term, since, as soon as the trust of users in this new form of money vanishes, its value will be completely

[49] FabricVentures for TokenData, *The State of the Token Market, A year in Review & an Outlook for 2018*, p.3, available at https://static1.squarespace.com/static/5a19eca6c027d8615635f801/t/5a73697bc8302551711523ca/1517513088503/The+State+of+the+Token+Market+Final2.pdf

lost. However, what is still missing in the global panorama is a well-defined legal and fiscal classification of Bitcoin and of cryptocurrencies. Actually, if the supporters of cryptocurrencies continue to grow, the state authorities will immediately wonder how they will regulate the system. Some countries have already begun to regulate it, with different solutions.

Before giving an overview of the countries which are trying to define and regulate cryptocurrencies, we try to provide a general definition of the legal nature of cryptocurrencies.

1.4.1 Crypto legal and fiscal framework

By analyzing different Government's approaches, we can say that countries usually classify cryptos as:[50]

1. An alternative method of payment;
2. An investment;
3. A commodity.

- An alternative method of payment

At first glance, as the term "crypto-currency" suggests, the most obvious way to classify them is related to the legal category of money. In fact, Bitcoin is used to buy and sell goods and services and can be converted to fiat currency. It typically meets the four basic requirements (defined by the European Central Bank and the German Bundesbank[51]) that satisfy money:

- a store of value;
- medium of exchange;
- unit of account;

However, there are different opinions as to whether cryptocurrencies possess or not these functions.

[50] Journal of Business & Securities Law, Tara Mandjee, *Bitcoin, its Legal Classification and its Regulatory Framework,* 2015, available at https://digitalcommons.law.msu.edu/cgi/viewcontent.cgi?article=1003&context=jbsl

[51] European Central Bank, *Virtual Currency Schemes*, October 2012, available at https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemes201210en.pdf

a) Store of Value

According to the International Monetary Fund, store of value referred to money means that "people can save it and use it later- smoothing their purchase over time".[52] If one purchases Cryptos it does not mean that one has to spend it immediately. Indeed, the key pairs (that allow you to receive Bitcoin) and the corresponding private key (that keeps both keys safe) can be stored for years before the value is retrieved.[53] Besides, how can cryptocurrencies be a store of value if their price is very volatile?[54] People often compare Cryptos with gold but they are not a safe asset and a safe haven, which means that it does not maintain its value over time.[55]

b) Medium of exchange

Money is considered a medium of exchange when "people can use it to buy and sell from one another." [56] Apparently, Bitcoin seems to possess this characteristic and fulfill the medium of exchange function. For example, in the Czech Republic, bitcoin can be used to buy luxury goods, beer, and other products. There are about 30 businesses that accept payment in bitcoin currency.[57] There are different opinions about cryptos and the possibility to make them a medium of exchange in the near future. As a matter of fact, cryptos transactions are expensive, slow, have a limited volume and are energy-intensive, which cannot contribute to making them a popular medium of exchange in its current status. However, developers are continuously working to find new ways to improve Cryptos platforms protocol. [58]

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[52] International Monetary Fund, *What Is Money*?, September 2012, available at http://www.imf.org/external/pubs/ft/fandd/2012/09/basics.htm

[53] Artus Krohn-Grimberghe, University of Paderborn, Germany Christoph Sorge, University of Paderborn, Germany, *Practical Aspects of the Bitcoin System*, available at https://arxiv.org/pdf/1308.6760.pdf

[54] Forbes, Matt Hougan, W*hat Gold's History Teaches Us About Bitcoin As a Store Of Value,* May 23, 2018, available at https://www.forbes.com/sites/matthougan/2018/05/23/what-golds-history-teaches-us-about-bitcoin-as-a-store-of-value/#6afce181260e

[55] Filippo Giannini, *Gold vs. Bitcoin*, October 19, 2017, available at https://www.tradingfacile.eu/blog/il-bitcoin-non-e-il-nuovo-oro/

[56] International Monetary Fund, Supra note 55

[57] Czech News, *Bitcoins can buy beer, shoes in CR*, January 1, 2014, available at https://www.praguepost.com/czech-news/34189-bitcoins-can-buy-beer-shoes-in-cr

[58] Robert Cookson, *Bitcoin analysis part 3: can it be a useful medium of exchange?*, December 20, 2017, available at https://medium.com/@robert.cookson/bitcoin-analysis-part-3-can-it-be-a-useful-medium-of-exchange-d7415b2eef92

c) Unit of account

Unit of account is the most important characteristic of money and means "providing a common base for prices"[59], that is the measurement for value. In particular, a unit of account has three main features:[60]

- It is divisible. A unit of account has to be divided and its components must be equal to the original value.
- It is fungible. It means that it is interchangeable, which implies there is no difference between, for example, one dollar and another dollar.[61]
- Countable. "A unit of account is also countable and subjected to mathematical operation."[62]

Bitcoin in theory would fall within the definition of unit of account. In Germany for example, the ministry of finance has officially recognized Bitcoin as a 'unit of account' also to be used for private transactions. [63] Anyway, what does not fit this definition is that a unit of account needs to have a stable value and, as we saw in the previous Bitcoin's images, the market capitalization is not so stable and this is one of the reasons why many countries have banned or decided not to adopt it.[64]

- An investment

Every user, before purchasing cryptos, wonders if bitcoin is a safe investment. From a legal point of view, bitcoin is not an option, a stock, a bond and (for now) a foreign currency that fulfills the definition of 'security'.[65] The real question is if bitcoin, according to the Article 3(a)(1)(c) of the Security Exchange Act of the American Law, can be defined as an "investment contract". An investment is secure if:[66]

1. There is an investment of money.

Bitcoin does not fit this legal definition because it is not already authorized by many governments.

2. There is an investment in a Common Enterprise.

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[59] International Monetary Fund, supra note 55
[60] *Money as a Unit of Account: Definition, Function and example*, available at https://study.com/academy/lesson/money-as-a-unit-of-account-definition-function-example.html
[61] Definition available at https://financial-dictionary.thefreedictionary.com/fungible
[62] *Money as a Unit of Account: Definition, Function and example*, supra note 63
[63] Charles Arthur, *Bitcoin now 'unit of account' in Germany*, August 19, 2013, available at https://www.theguardian.com/technology/2013/aug/19/bitcoin-unit-of-account-germany
[64]Simon Kinahan, *Does Bitcoin fulfill the classic economic functions of money?,* January 11, 2014, available at https://www.quora.com/Does-Bitcoin-fulfill-the-classic-economic-functions-of-money
[65] *Bitcoin, its Legal Classification and its Regulatory Framework,* supra note 53
[66] *What is an investment contract under Securities Law*, available at https://thebusinessprofessor.com/knowledge-base/what-is-an-investment-contract-under-securities-law/

Bitcoin buyers and miners work together in order to make the currency valuable and maintain the ecosystem stable but, at the same time, they do not merge to create a single company. However, the definition of "common enterprise" depends on the state.[67]

3. It derives solely from the efforts of others.

In theory miners can be compared to managers and we can say that the value of users' investment depends on their work. In fact, miners in fact are the ones who keep the crypto ecosystem afloat by constantly ensuring the robustness and safety of the blockchain. Internet users are divided into two parts: those who think that purchasing bitcoin is a very speculative investment due to its high volatility (and this is one of the reasons why for example China decided to put restrictions on it); others who strongly believe that cryptos are the future of payments and open business, so they try to mine as many bitcoins as possible. In Norway bitcoin is officially considered an investment, so the Government provides protection for investors (therefore who owns them has to pay taxes).

-A commodity

A commodity is "a basic good used in commerce that is interchangeable with other commodities of the same type".[68] Here again we have the same problem for the investment category one. The problem is the high volatility of the currency. According to the U.S law[69], Bitcoin falls under the definition of "useful articles of commerce" and "capable of being possessed".[70] Usually bitcoin is compared to gold because many operators believe it has a limited supply and has repeatedly seen its price rise thanks to geopolitical tensions. Key components in common:[71]

- Scarcity

It is not easy to add new quantities of cryptos or gold to the existing supply.

- Finite supply

The gold supply is considered finite. Similarly, every crypto has a limited number of coins that can be mined.

- Inherent value

Both bitcoin and gold have value which makes them an asset.

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[67] CryptoCurents, *The Fifth Factor: Are Cryptocurrencies Securities?,* December 11, 2017, available at https://www.cryptocurrentsblog.com/cryptocurrents/the-fifth-factor-are-cryptocurrencies-securities
[68] Definition available at https://www.investopedia.com/terms/c/commodity.asp
[69] *Virtual currencies are commodities, US judge rules*, March 7, 2018, available at https://www.cnbc.com/2018/03/07/cryptocurrencies-like-bitcoin-are-commodities-us-judge-rules.html
[70] *Journal of Business & Securities Law,* supra note 53
[71] Daniel Trading, *Bitcoin: commodity or currency?*, December 12, 2017, available at https://www.danielstrading.com/2017/12/12/bitcoin-commodity-currency

However, with the current regulation, unlike gold, bitcoin is not a safe-haven asset, which means that it does not maintain its value over time. When the economy is in a recession or when extraordinary and unpredictable events occur, precious metals will always be a safe investment. Cryptocurrencies do not present these guarantees. Indeed, because of their great volatility and the probability that digital portfolios could be hacked, they are considered not a safe investment.

1.4.2 Bitcoin legality around the world: a general overview of government approaches

We will try below to give a general overview of governments' approach to cryptocurrency by examining the most relevant governments' decision to ban or make the crypto market legal.

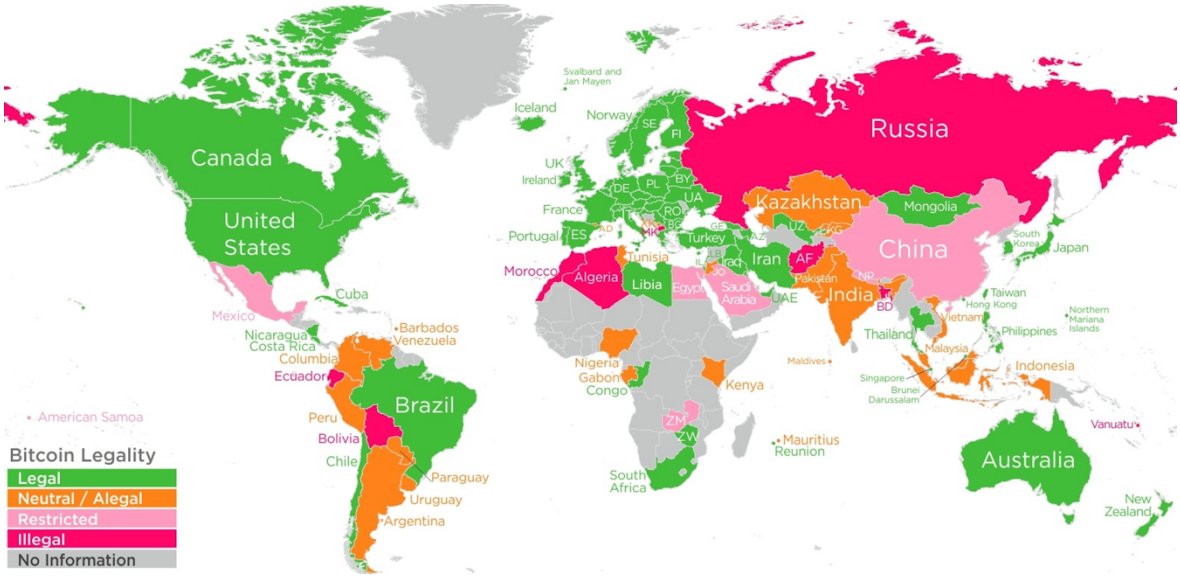

Fig. 14

Bitcoin Legality Around the World: various degrees of acceptance in different countries.[72]

As we can see in the map (fig. 14), what we can immediately notice is that the eastern countries are more reluctant to adopt bitcoin than the western ones.

We can divide territories in three main areas:

1. U.S.
2. European countries

[72] Available at https://www.valuewalk.com/2018/01/bitcoins-illegal-russia/

3. Asian countries

-Since the beginning, the USA showed a positive attitude towards the currency, and is continuing to support blockchain technological projects thanks to the presence of blockchain consulting and bitcoin support organizations distributed along the territory. In fact, in 2013, U.S. Government accepted Bitcoin as a decentralized virtual currency and in September 2015 the Commodity Futures Trading Commission (CFTC) classified it as a commodity.[73] Due to the fact that Cryptos are a property they are also taxable. The chairman of the Securities and Exchange Commission stressed the need to protect citizens who want to invest in cryptocurrencies. By showing a pragmatic and innovation-oriented vision, he also stated that the phenomenon of cryptocurrencies and Initial Coin Offering could be a valuable tool for companies, especially for Small-Medium Enterprises, in order to gain capital in the market and stimulate the economy and growth of the country. Indeed, there is not a precise regulation yet, but the fact that America is positive towards crypto market is definitely a point of reference and a plus for the market.

- The European Commission set up the Blockchain Observatory and Forum with the aim of monitoring the most interesting blockchain developments and projects on the European territory, in order to make funding available and encourage governments, European industries and citizens to invest in it and take advantage of the opportunities provided by this new technology. In particular we can say that the various countries of the European territory are moving independently.

For example Zug, Switzerland, can be considered a real capital of the cryptocurrencies ecosystems (a 'Cryptovalley') where there are about 200 companies that deal with new currencies. On February 2018 the Swiss Financial Market Supervisory Authority (FINMA) published guidelines for updating the previous supervisory report of September 2017, that clarifies the hypotheses according to which the promoters of an Initial Coin Offering are subject to the rules valid for banks and intermediaries, with the obligation of prior authorization to the activity and subject to prudential supervision. It is interesting to notice that in this document the Swiss Authority provides useful tools for operators, identifying different economic functions of the issued tokens:

- payment token;

[73] More information available at https://www.cftc.gov/Bitcoin/index.htm

- utility token;
- investment token.

Germany is completely Crypto friendly, encouraging blockchain projects, allowing people to transact and trade crypto and contributing to the growth of the crypto world market. Recently, the German Federal Financial Supervision Authority (BaFin) has also issued a statement to clarify the obligations that the ICO promoters must be submitted to. The German approach is different from the Swiss as it tried not to provide general classifications but to clarify the applicable law in the event that the token can be assimilated to:

- a share of an investment fund;
- a share capital stock;
- financial instruments;

remembering that, depending on the configuration, token trading could be classified as:

- a banking activity;
- an issue activity;
- a financial service;

by requiring prior authorization for the exercise and the subjection to the relevant discipline.

Finally, France, in July 2014, has legalized crypto transactions. The Council of State has established that the gains generated by cryptocurrencies must be considered as gains on "real estate". In fact, under the previous regime, the plus-values of the crypto-assets were considered as corporate profits (in case of permanent activity) and / or as non-commercial profits (for occasional activity). With the new tax regime instead, the sale of bitcoins will be compared to a tax sale of physical and / or property goods.

- In Asia, the situation is still strongly fragmented. Japan is now working on developing the fastest blockchain technology in the world and is considered a real hub for cryptos trading and exchanging in Asia. Hong-Kong is also crypto friendly and have many for-profit companies related to bitcoin and cryptocurrencies activities offering services such as Payment, Wallet providers, crypto exchange. Besides, it is possible to find bitcoin ATM around cities. Unlike Japan and Hong-Kong, South Korea and, especially China, have not embraced and supported the crypto ecosystem so far. Actually, the situation is more complex than it seems to be. For this reason, in the next chapter we will give a clear and detailed panorama of the current situation in China.

Chapter 2- The Crypto Ecosystem in China

2.1 The Adoption of cryptocurrencies in China

Since 2013 the phenomenon of cryptocurrencies has exploded also in China, both with transactions and, above all, from the point of view of mining, with the birth of a solid network of entrepreneurial structured miners and the creation of real bitcoin factories, whose rise was favored by environmental factors (such as the low energy cost) and the initial lack of interest of the Chinese authorities. China has rapidly become the reference country for cryptocurrency and mining so as to determine the impact that it has on the global market.

Bitcoin does not represent the first time that the Chinese market interfaces with virtual currencies. In 2002, the Chinese *Tencent Company*, launched the "Q-coin"[74], an online payment system that allowed users to use coins to purchase services such as electronic tickets or software. The main platform where these coins were exchanged, was *Taobao*, the most popular auction web-site in China similar to eBay. Subsequently, the users began to exchange Q-coins among themselves and on other online platforms for goods and services. On April 9, 2007, Taobao reported 26415 Q-Coin listed in the platform.[75] Q-Coin became so popular that a prompt reply from the Chinese government arrived in 2009. Q-Coin was definitely closed when the People's Bank of China issued an announcement stating that virtual currencies could be traded only for virtual goods and on-line services, in order to avoid such virtual coins affecting the real economy.

Bitcoin instead was introduced for the first time in the country in May 2013 through a long documentary by CCTV, the Chinese national television[76]. Surprisingly, China, in a very short time, became the first nation to hold the highest number of BTC wallets.

[74] Gwynn Guilford, *Six Reason why Chinese people will drive the next bull market in bitcoin*, April 13, 2013, available at https://qz.com/74137/six-reasons-why-chinese-people-will-drive-the-next-bull-market-in-bitcoin/
[75] Virtual Economy Research Network, *The Q-coin secondary market practice,* April 27, 2007, available at https://virtualeconomyresearchnetwork.wordpress.com/2007/04/27/the_q_coin_secondary_market_in/
[76] The documentary is still available on Youtube in Chinese at https://www.youtube.com/watch?v=aw3OSTkdE-s

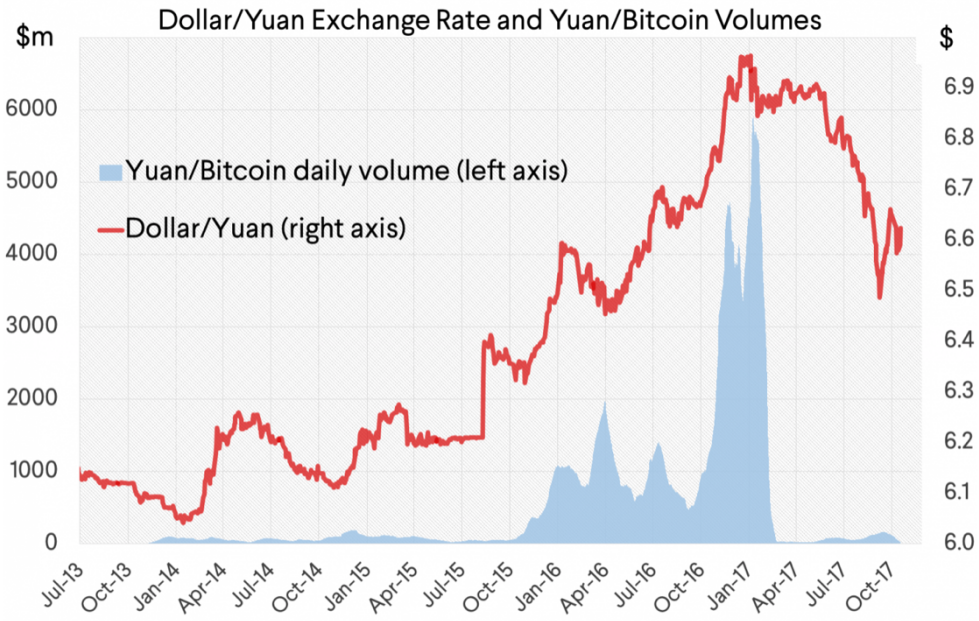

Fig 15

The figure represents highs and lows of the Dollar/Renminbi (red line) and Bitcoin/Renminbi (blue line). [77]

Due to the large volume of cryptocurrencies transactions, in October 2013, even the most important Chinese e-commerce platforms (such as Taobao, Baidu, etc.) began to accept Bitcoin payments, causing a big impact in the Bitcoin market and surpassing Japan in volume of transactions. This sudden boom in cryptocurrencies in China, and in particular Bitcoin, is closely linked to a series of events in China that coincided with the introduction of Bitcoin in the country.

There are three main factors that led to the adoption of cryptocurrencies in the country:

1. Weakness and devaluation of the Chinese Yuan
2. Anonymity of the cryptocurrency
3. Low cost of electricity in the country

- The bitcoin boom in China may be linked to the trend of the Renminbi, the official currency of the People's Republic. It can be showed that every time the Yuan devalues, bitcoin reevaluates itself (see Fig.15). It is not a coincidence that, at the same time as the yuan slips, there were peaks in bitcoin prices. For example, when the Chinese Government decided to devaluate the Yuan in 2015 or the Brexit vote affected market in 2016, cryptocurrencies began to perform positively (fig.15). The Chinese Government stated that these devaluations

[77] Available at https://www.cfr.org/blog/bitcoin-and-yuan

maneuvers of the Chinese currency would be only occasional and would make the Yuan more accessible in the free market. However, this decision was certainly destabilizing, not only for the domestic market but also on the Asian market, making many capitals flee from China in search of better returns. For this reason, cryptocurrencies (and bitcoin in particular) despite their volatility and non-regulation, have been used as a digital alternative to traditional, centralized value reserves. According to a study by Harbin University on the adoption of cryptocurrencies in China,[78] awareness, perceived ease of use, usefulness, trustworthiness, have a positive meaning in the intention to adopt cryptocurrencies as an alternative currency to the Yuan. In fact, the survey shows that if the citizens would well be informed about the functioning of the system and if would be regulated or legal, they will adopt the cryptocurrency as an alternative currency, thanks above all to the anonymity of its users.

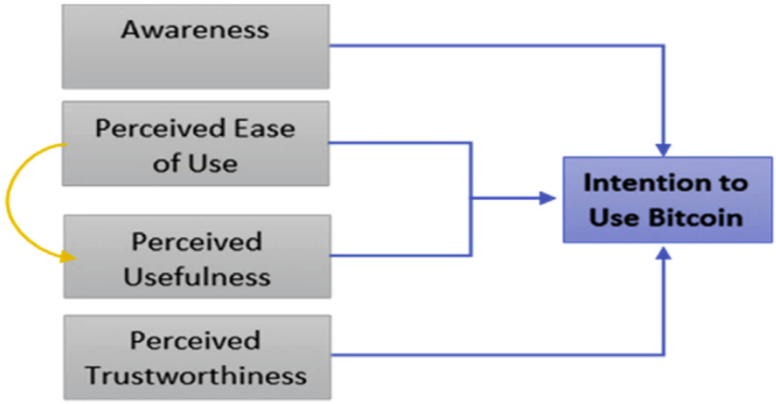

Fig.16

Research Framework of the Study carried out at Harbin University, China. [79]

- Another decisive factor that leads China to have a positive attitude towards cryptocurrencies are the drastic measures on capital control and the transparency of financial transactions by the Chinese government. These limits, according to the Central Government, are aimed not only at fighting money laundering but also at controlling the shadow banking phenomenon[80] that continues to cause concern. This limitation by the government has an

[78] Fakhar Shahzad, GuoYi Xiu, Jian Wang, Muhammad Shahbaz, in collaboration with School of Economics and Management, Harbin University of Science and Technology, *An empirical investigation on the adoption of cryptocurrencies among the people of mainland China*, January 27, 2018, available at https://www.sciencedirect.com/science/article/pii/S0160791X18300204

[79] Supra Note 78, page 3

[80] According to the on-line Cambridge Dictionary, Shadow banking phenomenon can be defined as "financial activities such as lending or investing money carried out by organizations that are not officially banks and so do not have to obey the same rules". Definition available at https://dictionary.cambridge.org/dictionary/english/shadow-banking

important structural choice that goes beyond the control of capital and is a sort of security for the entire financial system in view of the complete liberalization and stability of the Renminbi. According to law, we remind that in China the investments of Chinese companies abroad in military technologies, in gambling, in the sex industry and in any case investments contrary to national security are forbidden. While foreign investments in real estate, in hotels, in the entertainment industry, in sports and those related to obsolete or contrary to environmental regulations are subject to strict limitations. It is in this context that the cryptocurrencies, which possess the characteristic of carrying out transactions in complete anonymity, are presented as the right key to avoid strict Chinese capital controls.[81]

-Finally, the last element that contributes to the growth of Bitcoin is the low cost of electricity in the country. As of July 2018, China held more than 80% of the mining factories in the world. [82]

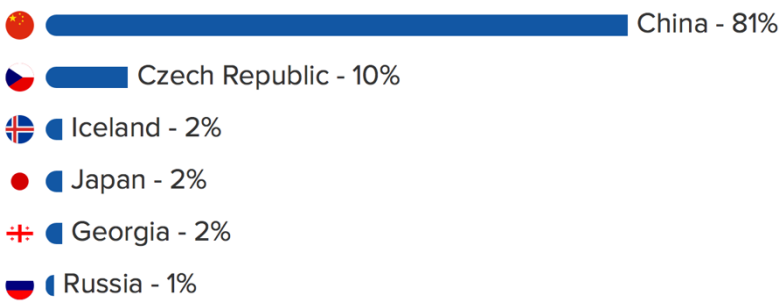

Fig. 17

Top six mining pool concentration in the world. [83]

In fact, China occupies the third place (preceded only by India and South Africa) as a country where electricity has the lowest cost all over the world, especially if we compare the prices of the countries that occupy the highest positions in terms of GDP production (Germany, Italy, Belgium). As the economic profit of a miner is represented by the value of gained bitcoins minus the energetic costs spent to obtain it, lower electricity costs are directly linked with higher profits, which incentivizes mining in those countries where energy costs are lower. According to Zennon Kapron, Director of Kapronasia (one of Asia's leading financial technology research and consulting firms) China has become an important mining hub and

[81] Further information about the *Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures* available at http://investmentpolicyhub.unctad.org/InvestmentLaws/laws/153

[82] Jordan Tuwiner, *Bitcoin mining pools*, June 30, 2018, available at https://www.buybitcoinworldwide.com/mining/pools/

[83] Ibidem

has a major contribution to the volume of Bitcoin transactions. The Chinese miners, composed of hardware engineers and IT enthusiasts, rent very large spaces and equipment where they can store their computers and mining Bitcoins. Hong Kong has also become attractive to miners due to its proximity to Chinese chip makers and its technology-friendly regulatory environment.

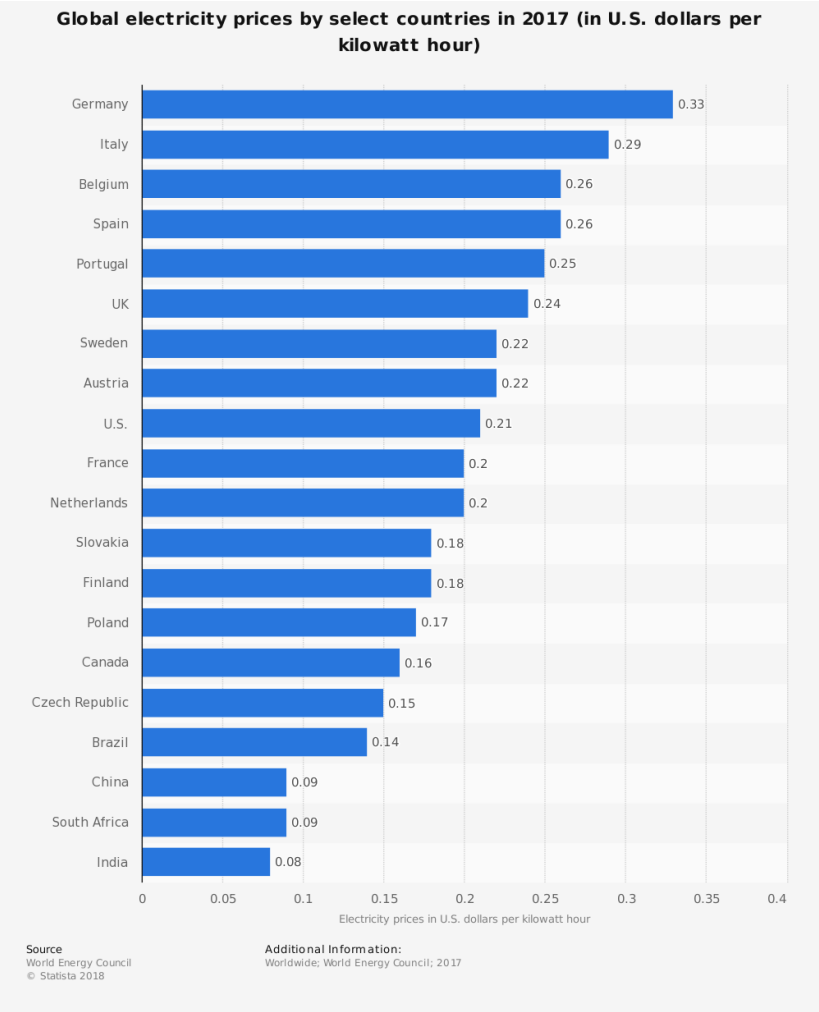

Fig. 18

Electricity prices in selected countries. [84]

This sudden expansion of the phenomenon of cryptocurrencies was brought to the attention of the administrative and political authorities of the People's Republic who was quick in taking position on the issue. The first intervention on cryptocurrencies by the Chinese authority was on December 5, 2013, when the People's Bank of China issued the first Bitcoin regulatory document that alerts citizens over potential risks deriving from the use of Bitcoin cryptocurrency. The document mainly focuses on pointing that Bitcoin, as a virtual

[84] Available at https://www.statista.com/statistics/263492/electricity-prices-in-selected-countries/

cryptocurrency, cannot be compared to Renminbi, and forbids trading of Bitcoin under any circumstance and in any form within China. On the occasion of this dissertation, we performed a full English translation of the text of the "First Notice over Bitcoin of the People's Bank of China", which is presented in its integral form in the next section.

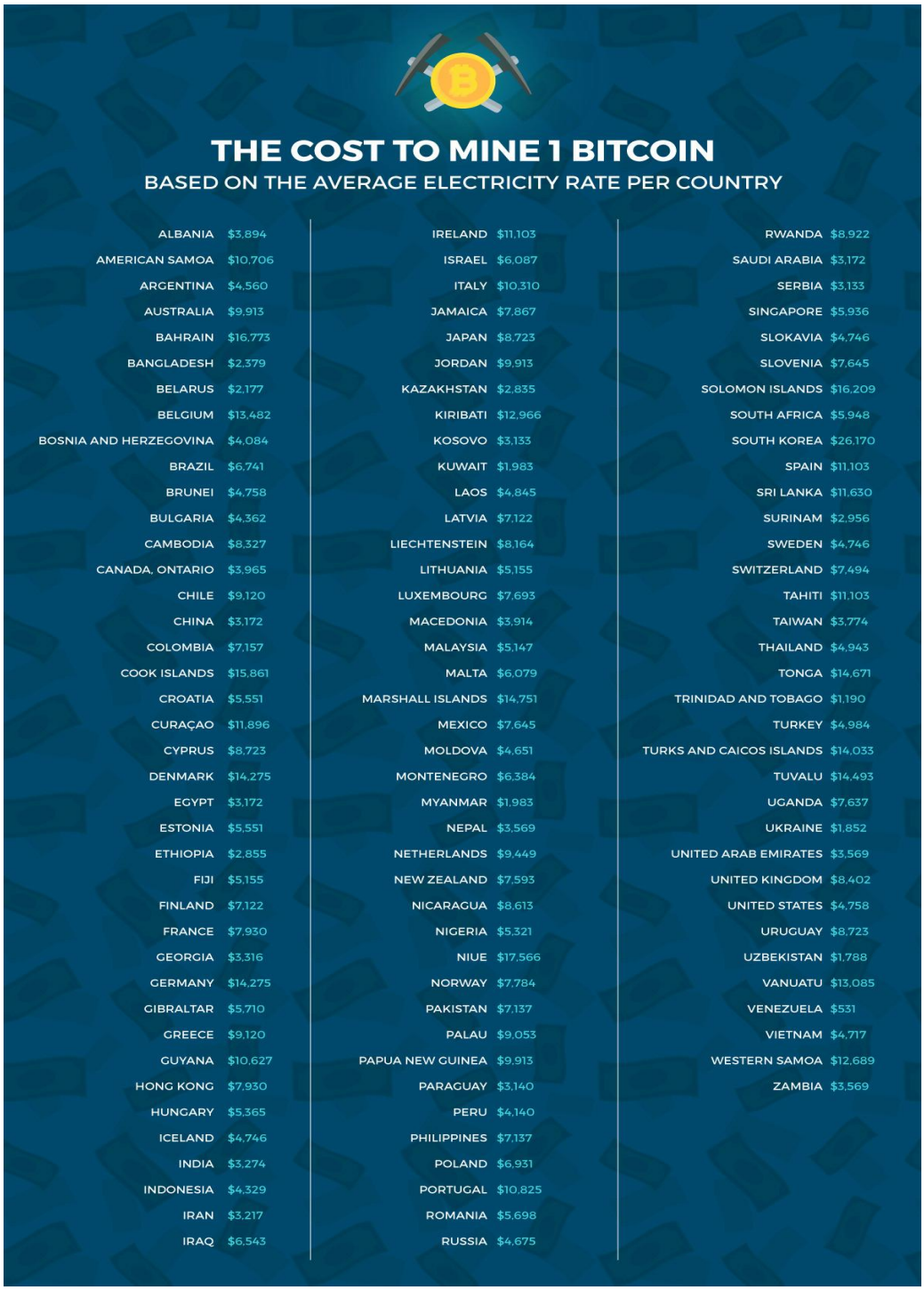

Fig. 19 The cost to mine one bitcoin. [85]

[85] Available at https://www.trustnodes.com/2018/04/26/bitcoin-mining-costs-just-3000-china-500-venezuela-4700-usa

2.2 Full text of the "First Notice over Bitcoin of the People's Bank of China": English version

The People's Bank of China and five ministries jointly issued the "Circular on Preventing Risks from Bitcoin/cryptocurrencies[86]"

(Yin Fa [2013] No.289) ("Circular No. 289") （银发〔2013〕289 号）

In order to protect the public property rights and interests of the society (社会公众的财产权益), the legal currency status of the Renminbi, prevent the risk of money laundering and maintain financial stability, the people's Bank of China, the Ministry of Industry and information technology, the China Banking Regulatory Commission, the China Securities Regulatory Commission and the China Insurance Regulatory Commission, have jointly issued a "Notice of on preventing Risks from bitcoin (比特币)",

The Notice (通知)clarifies the nature of Bitcoin, believing that Bitcoin is not issued by the monetary authorities, it does not have monetary attributes such as legal and mandatory, and it is not a real currency. In terms of nature Bitcoin is a type of virtual commodity that does not have the legal status equivalent to a currency and cannot and should not be used as currency in the market. However, bitcoin transactions act as a way of buying and selling goods on internet; ordinary people have the freedom to possess them and participate at their own risk.

The Notice requires that at this stage, financial and payment institutions should not use Bitcoin as a price for products or services, buy, sell or trade Bitcoin as a central counterpart, cover insurance business related to Bitcoin, include Bitcoin in insurance liability and should not directly or indirectly provide customers with other bitcoin-related services, including:

- providing customers with Bitcoin registration;
- trading, clearing, settlement and other services;
- accepting Bitcoin or using Bitcoin as a payment settlement tool;

[86] It is worth to stress that the term *Bitcoin* in Chinese (比特币 – bitebi) is initially used in this 2013 Notice, to refer to *cryptocurrencies* in general. However, during the course of the following years, the term started to indicate Bitcoin cryptocurrency only.

- exchanging services for RMB and foreign currencies;
- carry out services such as storage, custody and mortgage of Bitcoin;
- issuing financial products related to Bitcoin;
- use Bitcoin as an investment target such as trusts, funds and so on.

The Notice stipulates that the Bitcoin on-line platform, which is the main trading platform for Bitcoin, must be in line with the telecommunication's regulatory agency in accordance with the Regulations of Telecommunications of the People's Republic of China and the Regulation of Internet Information Service of the People's Republic of China. At the same time, in response to Bitcoin's high risk of money laundering and the risk of being used by criminals, the Notice requires relevant agencies to effectively perform legal anti-money laundering such as customer identification and suspicious transaction reporting in accordance with the requirements of the Anti-Money Laundering Law of the People's Republic of China.

In order to avoid excessive speculation of the so-called "virtual currency" such as Bitcoin, etc., which harms the public interest and the legal currency status of the RMB, the Notice requires financial institutions and payment institutions to correctly use the currency concept in their daily work, focusing on strengthening the education of the currency knowledge. The concept of a correct understanding of the currency, a correct view of virtual goods and virtual money, rational investment, rational control of investment risk, and safeguarding the security of their own property are included in the content of the activity of financial knowledge and the public will be guided to establish correct currency concepts and investment ideas.

In the future, the People's Bank of China will continue to closely monitor the movements and related risks of Bitcoin based on its own responsibilities.

Appendix (附件):

The people's Bank of China, the Ministry of Industry and Information Technology, the China Banking Regulatory Commission, the China Securities Regulatory Commission and the China Insurance Regulatory Commission, jointly issued the

Notice on Preventing Risks from Bitcoin

Recently, the so-called "bitcoin", calculated by particular computer programme, has attracted widespread attention internationally. There are also some institutions and individuals in the country who have taken the opportunity to speculate on bitcoin and bitcoin-related products. In order to protect the property rights and interests of the public, protect the legal currency status of the renminbi, prevent the risk of money laundering, and maintain financial stability. In accordance with the People's Bank of China Law, the Anti-Money Laundering Law of the People's Republic of China, the Regulations of Telecommunications of the People's Republic of China, the Regulation of Internet Information Service of the People's Republic of China and other relevant laws and regulations, the following matters are hereby notified as follows:

1. An accurate acknowledgement (属性) of the nature of the cryptocurrency

Bitcoin has four main features:

- It is not issued by any official monetary authority;
- It has a limited volume;
- It has no geographical restrictions;
- It maintains anonymity.

Although bitcoin is called “currency”, it is not a currency from a legal perspective because it is not issued by the monetary authority and does not have monetary attributes such as legal and mandatory. In terms of nature, Bitcoin should be considered specific virtual goods, does not have the legal status equivalent to currency and cannot and should not be used as currency in the market.

2. Prohibiting financial institutions and non-bank payment agencies from carrying out related business. (不得开展与比特币相关的业务)

At this stage, financial institutions and payment agencies are not allowed to:

- Price goods or services in cryptocurrencies/ bitcoin
- Purchase or sell bitcoin/ cryptocurrency as a central counterparty
- Underwrite any insurance business relating to bitcoin in any insurance coverage
- Directly or indirectly provide customer with other services relating to bitcoin including procuring clients with registration, trading, clearing and settlement services relating to bitcoin; accepting bitcoin or using bitcoin as means of payment or settlement; providing an exchange service between bitcoin and RMB/foreign

currencies; carrying out deposit, custody or mortgage businesses relating to bitcoin; distributing financial products relating to bitcoin, etc.

3. Strengthening the management of platforms. (加强对比特币互联网站的管理)

According to the "Regulations on Telecommunications of the People's Republic of China " and "regulation on internet information Service of the People's Republic of China", Internet sites that provide services such as Bitcoin registration and transactions must be filed with the telecommunication's regulatory agency.
According to the opinions of the relevant administrative departments, the telecommunications management organization may close the illegal Bitcoin website according to law.

4. Prevent the risk of money laundering (洗钱) that Bitcoin can generate.

The branches of the People's Bank of China should pay close attention to the movements and trends of Bitcoin and other similar virtual goods with features such as anonymity and cross-border circulation convenience, carefully study the risk of money laundering, and study and formulate specific preventive measures. Each branch shall include anti-money laundering supervision in institutions that establish and provide services such as bitcoin registration and transactions in the jurisdiction and urge them to strengthen anti-money laundering monitoring.
Internet sites that provide services such as bitcoin registration and transactions should fulfill their anti-money laundering obligations, identify the user's identity, and require users to register with their real names and ID numbers. All financial institutions, payment institutions, and internet sites that provide services such as Bitcoin registration and transactions should immediately report suspicious transactions related to Bitcoin and other virtual goods to the China Anti-Money Laundering Monitoring and Analysis Center and cooperate with the People's Bank of China. Criminal activities such as fraud, gambling and money laundering should be reported to the public security organs in time.

5. Strengthening education of the general public's monetary knowledge (社会公众货币知识的教育) and point out investment risk.

All departments, financial institutions, and payment agencies shall correctly use the concept of currency in their daily work and make efforts to improve the public's understanding of related knowledge by including in their financial knowledge popularization activities the definition of currency, attributes of virtual goods and virtual currencies, as well as concepts of rational investment, reasonable control of investment risks and property protection, in order to provide guidance for the public on correct concepts of currency and investment.

Each financial regulatory agency may formulate relevant implementation rules in accordance with this notice.

The People's Bank of China Shanghai Headquarters, Branches, departments of business management, provincial capitals, banks of city center will forward this notice to all local financial institutions and payment institutions within the jurisdiction. Please report in time any new situations or problems discovered during the implementation of this Notice to the People's Bank of China.

People's Bank of China

Ministry of Industry and Information Technology

Banking Regulatory Commission

Securities Regulatory Commission

Insurance Regulatory Commission

December 3, 2013

2.2.1 How the legislative text is interpreted: a general overview

It is not surprising, due to the number of bitcoin transactions that has grown dramatically in China, the response of the Central Bank of China that immediately has taken a position defining the nature of the bitcoin. Shortly after the release of this statement, the trade volume of Bitcoins has fallen so dramatically in the Country that means, for the world, a decrease of 20% in their value.

If the Bank of China expresses doubts about the bitcoin currency with a statement, it is likely to think that all the subjects dealing in bitcoins will be cut off from the banking world, making it very difficult for the Chinese user to circulate digital currencies.

In fact, this Notice is a warning for many problems that may arise from trading in Bitcoin/cryptocurrencies. First of all, the risk that platforms are subject to hacker attacks, or the real possibility of being victims of fraud in a system of intermediation and exchange of this type. One of the main reasons for the ban is that payments via Bitcoin ensure anonymity to those who use it. This is why the authorities fear that this method can encourage the laundering of money from criminal activities by facilitating the proliferation of illegal businesses. Although the People's Bank of China does not consider the presence of this cryptocurrency for the national economic system to be a risk, the Notice warns citizens and businesses about the volatility of bitcoins and the fact that they must only be considered as a digital product and not a currency. Bitcoins are now accessible to the Chinese user, but they find it difficult to circulate the currency given the various limits imposed by the People's Bank of China and directly involving banks, financial institutions and payment systems.

These business entities can not offer bitcoin services, market them, nor provide insurance coverage for transactions traded in bitcoins, finally, and above all, deal with companies that trade or offer bitcoin services.

If on the one hand China sees bitcoin as an opportunity to exploit and it encourages intensive mining, on the other hand the authority looks suspiciously at this new uncontrollable currency and seeks to curb its use and regulate it.

It is interesting to note the timeliness of the reaction of Chinese power to the bitcoin phenomenon: the exponential growth of the currency in the country began in 2013 and by the end of the year the Bank of China issued a statement going to take a position on the main points in relation to the relationship of this currency with the institutions.

Already before the release of December 5, 2013, in November 2013, a director of the Bank of China stated that it is not likely to think that in the near future in China we can talk about bitcoin as a currency.

To understand the position of the Chinese legislator we must also think that we are talking about a monetary system that has had a recently international development, following many internal resistances.
In fact, until 1994 the Chinese currency did not have an official exchange rate, but it made a market-linked and a fixed exchange rate coexist to ensure greater control over the currency, which coexisted with considerable complications making it difficult to imagine international transactions in yuan.
The Chinese administration's approach to bitcoins is therefore prudent and suspicious and has on several occasions put a brake on the enthusiasm of Chinese users. Some experts have also hypothesize that the Chinese Government might be interested in obtaining a substantial monopoly of mining operations.

However, the risk of such interference seems remote, given the structural antifragility of the Bitcoin system and the fact that China can hardly gain absolute control over mining operations, also considering the progressive increase in the cost of resources in the country that makes a similar activity is less attractive.
The focus on people's China and its positions is therefore very high, given the demonstrated worldwide reach of the decisions of the Chinese authorities and since this nation has recently become the physical location where many of the bitcoin currency operations are carried out in the world.

2.2.2 Critical analysis

We will try, below, to offer a detailed analysis of the Notice and examining the contents of some articles to better understand the value and purposes of the statement itself.

1. What types of activities are included in the parameters of the Notice?

Article 2 states that financial institutions (such as Mastercard and Visa) and payment institutions (such as Alipay, an online payment platform managed by the Chinese giant Alibaba) are “not allowed to use bitcoins as a price for products or BTC services ". In this way, the Chinese central bank has forbidden the financial sector of the country to use Bitcoin electronic money, to realize activities in this virtual currency, to guarantee investments in Bitcoins or invest in products that have to do with this currency. Against the risks associated with the use of money, it is usually thought that Bitcoins and digital currencies are totally

prohibited and illegal in China, but this is not the case. The ban is only on banks, since the central banking authority , the People's Bank of China, is 70% owned by the government Private individuals are in fact excluded from this prohibition, also shared by other supervisors insurance and monetary policy and the Chinese Industry Ministry.

2. Why clarifying the anonymous nature of bitcoin/Cryptocurrencies?

Article 1 clarifies the 4 characteristics that the bitcoin possesses, namely "no centralized distributor, limited volume, no geographical restrictions, anonymity." Given the characteristics, the rigid response from the government is not surprising. in fact, China's economic policy has recently been marked by two important developments: on the one hand, the strong growth of outward direct foreign investment (FDI), on the other hand the introduction of a strict regulation of the capital's outflows. The Chinese government aims to stabilize the Renminbi, which in recent months has fallen significantly, causing a capital flight. These measures have a macroeconomic dimension, but also affect the transactions related to the acquisition of assets or the realization of greenfield investments abroad: in particular, they explicitly limit foreign direct investment whose value exceeds certain thresholds. Chinese companies in advanced market economies (as well as in other regions) have difficulties in achieving high profitability and sometimes even generate negative returns. [87] In many cases, the realization of these investments involves controversial transactions. In fact, as mentioned above, the bitcoin has reached popularity in China thanks to its anonymous characteristic, as the operations are not traceable, and e help a greater flow of capitals which is bigger than the limits imposed by the government. Another reason why China is opposed to the entry of bitcoin in the country is the risk of money laundering, as cited in article 4. The bank in fact invites all the parties involved in anti-money laundering to report illegal activities and to raise the level of inspection against the bitcoin.

3. Are Blockchain activities and mining banned too?

Bitcoin can be obtained in two ways, i.e. trading and mining. As stated before, the Notice explicitly bans Bitcoin trading (i.e. cryptocurrencies trading) in any form but does not mention mining activities. Nevertheless, also mining will be specifically mentioned and

[87] Xiqian Cai, Yi Lu, Mingqin Wu, Linhui Yu, *Does environmental regulation drive away inbound foreign direct investment? Evidence from a quasi-natural experiment in China,* August 2016, available at https://www.sciencedirect.com/science/article/pii/S030438781630061X

banned by the Government in late 2017. As far as blockchain technology, the Chinese State Council has fully approved blockchain development projects in its 13th Five-Year Plan (*Guójiā shísānwǔ guīhuà*- 国家十三五规划). Startup involved in blockchain projects, however, must fight between innovation and control by the Government, thought still pending on an official regulation.

4. Is there any crypto income tax in China?

In many countries, such as the USA, Australia or Germany, cryptocurrencies are classified as a Property or a Commodity.[88] In China, according to article 1, they are classified as a "virtual currencies" and as the Notice states, the Ministry of Finance has not released any Cryptocurrencies taxation guidance, so we can say that China is "tax free" zone.

Country	Classification	Taxation
Australia	• Property	• Capital gains tax • Goods Service tax is not applicable
Germany	• Private money	• No capital gains tax. • If owned less than one year, a progressive income tax of up to 45% applies for all gains. . • Sales tax is not applicable
Switzerland	• Foreign currency	• No capital gains tax • Sales tax is not applicable
U.S.	• Property	• Capital gains tax • Sales tax is not applicable
U.K.	• Asset or private money: Determined by court on a case-by-case basis	• Capital gains tax • Sales tax is not applicable
Japan	• Legal method of payment	• Capital gains tax • Exempt from consumption tax
China	• Virtual commodity	• No taxes

Fig.20

Cryptocurrency Tax Law by Country.[89]

2.3 Consequences after China's Governmental ban

Immediately after the Notice was released, the Bank of China ordered Alibaba's Alipay to close all transactions in digital currency by January 31, 2014. On December 18, 2014, BTC China stated that it would no longer accept transactions in cryptocurrencies. Since China has

[88] Matthias Langer, *Taxation Cryptocurrencies in Europe*, available at https://cryptoresearch.report/crypto-research/taxation-cryptocurrencies-europe/
[89] Ibidem

become the world's largest bitcoin transaction market, it is not surprising that the effects of the Notice have had significant effects on the cryptocurrency market. In fact, after the Chinese Government's trading ban, the value of Bitcoin dropped by more than 50% compared to December 1, 2013.

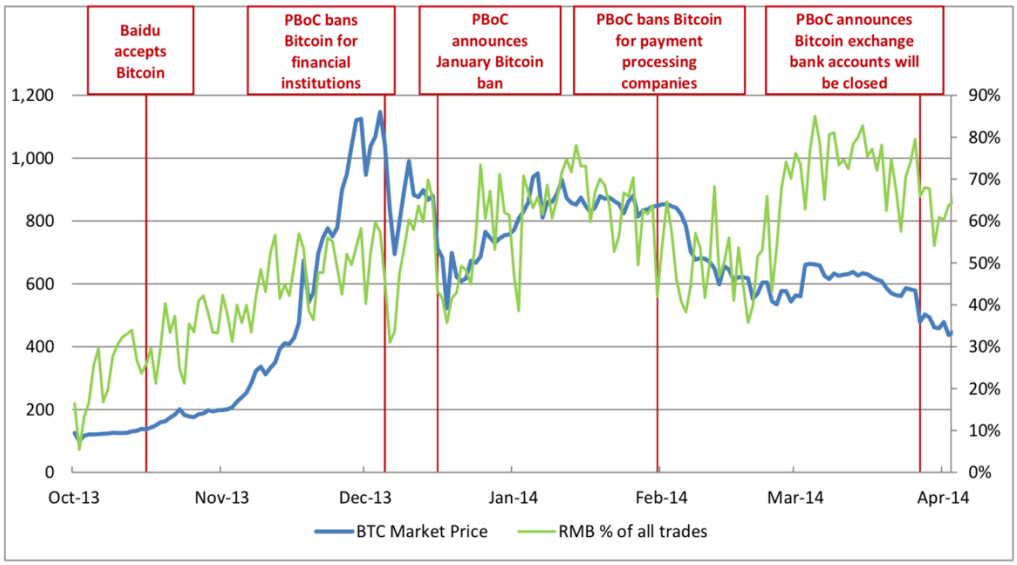

Fig. 21

China's Bitcoin timeline from Nov. 2013 to March 2014. The blue line marks the BTC Market Price while the green one the percentage of Renminbi of all trades. [90]

Despite the government position, BTC China and other Chinese exchanges have been able to continue to negotiate cryptocurrencies finding loopholes that would allow them to make payments directly into their corporate bank accounts. In March 27, 2014, seemed that the People's Bank of China had closed some loopholes of users of the Bank of China. After this move, the price of Bitcoin slowly decreased.

The Chinese and global Bitcoin market expected the move would force all cryptocurrency trading platforms in China to shut down or move their servers abroad and rely on foreign bank accounts and payment companies. These restrictions, however, have never been implemented and there has been no control from the Chinese authorities. In fact, none of the main trading platforms received any notice, and the ban didn't prevent BTC China CEO Bobby Lee from installing the first bitcoin ATM in Shanghai in April 2014, five months after the issuing of the ban[91]. Until the government adopts an official policy toward

[90] Source: Bitcoinity.org

[91] Pete Sweeney, *China gets first bitcoin ATM, skirting bank crackdown,* April 16, 2014, available at https://www.reuters.com/article/us-china-bitcoin/china-gets-first-bitcoin-atm-skirting-bank-crackdown-idUSBREA3F0MK20140416

cryptocurrencies, rumors of continued regulation may continue to affect the global Bitcoin market.

The year 2015 did not start with a positive trend for the Bitstamp[92] exchange platforms in Slovenia and Bitcoin Bter[93] in China. Two major hacker attacks were carried out this year, the first in January 15 and the other on February where $ 5 and $ 1.75 million were stolen respectively.

In March, according to a report on the future of Goldman Sachs coins[94], one of the largest New York banks, emerges that 80% of the bitcoin volume is traded with the Yuan, second only to the US dollar, followed by the Yen and the EUR. Bitcoin always manages to take up land in China thanks to the ease through which capital can be moved anonymously, unlike the Chinese yuan.

Subsequently, between July and August, the Chinese government carried out two devaluations of the Yuan[95]. It is not difficult to identify the cause of these choices by the Chinese government. In fact, this measure came after the Chinese export data were disclosed in July, showing a decrease of 8.3% over the last twelve months. A logical and fair move to devaluate the currency in order to try to re-launch exports to the global market.

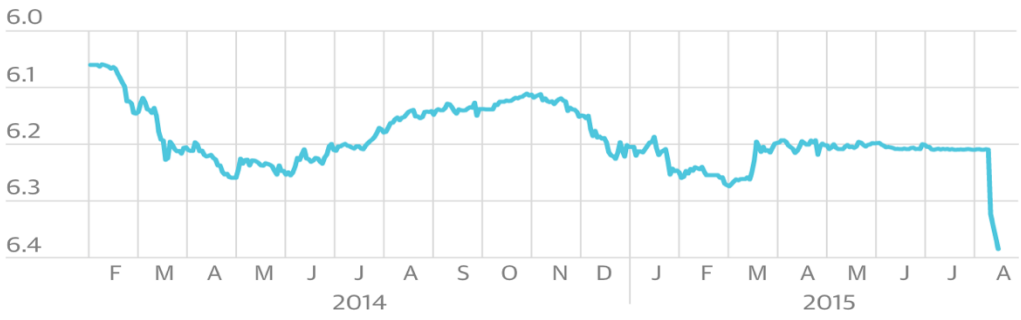

Fig. 22[96]

Value of Yuan against the US dollar between 2014 and the first half of 2015.

[92] Stan Higgins, *Detaile of $5 milion Bitstamp hack revaled*, July 1, 2015, available at https://www.coindesk.com/unconfirmed-report-5-million-bitstamp-bitcoin-exchange/

[93] Stan Higgins, *BTER Claims $1.75 Million in Bitcoin Stolen in Cold Wallet Hack,* February 15, 2015, available at https://www.coindesk.com/bter-bitcoin-stolen-cold-wallet-hack/

[94] Robert D.Boroujerdi, Christopher Wolf, *What if I told you..,* Goldman Sachs, December 2, 2015, available at https://www.goldmansachs.com/insights/pages/macroeconomic-insights-folder/what-if-i-told-you/report.pdf

[95] The Guardian, *China stuns financial markets by devaluing yuan for second day running*, August 12, 2015, available at https://www.theguardian.com/business/2015/aug/12/china-yuan-slips-again-after-devaluation

[96] Supra note 96

Some Western observers believe that this devaluation could be seen as a decision that fits into a broader framework, stating how it is the result of a change in the method by which the People's Bank of China calculates daily the exchange rate between the Chinese currency and the US dollar. From this rate (called midpoint) a maximum of 2% can be deviated from the currency transactions that take place within the country. The People's Bank of China stated that from now on, instead of establishing this rate in an autocratic and political way, they will be considering some market factors: in particular, the effective rate at which trades had occurred the previous day, for example taking into account how much the market had benefited from the 2% tolerance band. Some members of the Chinese government do not define it as a real assessment but the result of the first application of the new calculation system. On the contrary, the new mechanism continued to produce effects that go in the same direction as the first day of application, dropping the midpoint by another 1.6% and then subsequently by 1.1%. It must also be stressed that Beijing has renounced the autocratic fixation of the currency exchange but has not renounced its managerial attitude in economics. On the second day of application of the new system, when it was seen that the devaluation exceeded 2 percent, the Chinese government gave order to public owned banks to intervene by buying Yuan. At the end of the day it recovered 1%, allowing Bank of China to take account of market forces, and to contain the devaluation at 1.6%. This choice positively affected Chinese exports and in fact, at the end of 2015, the market recovered almost 30% from August lows and, after the government had blocked the new stock prices, there were already new companies on the waiting list to land on the list of Mainland China. This discussion on the devaluation of the Renminbi is linked, as already said, to Bitcoin (see Fig.15). Not surprisingly, during those months there was an increase in investments on cryptocurrencies in the Chinese market, considered as a safer, decentralized currency and therefore far from the government's moves.

Fig. 23

Bitcoin VS Offshore Yuan between January 2015 and January 2016.[97]

[97] SuisseGold, *China crashes Bitcoin*, available at https://www.suissegold.ch/page/china-crashes-bitcoin

If, in the first quarter of 2016, the Chinese currency continues to fall causing turbulence in the markets, Bitcoin has instead started to be positive. The cryptocurrency has indeed recorded a rise of +120% to $ 952.[98] According to some expert analysts behind this huge increase in the value of cryptocurrency is China. Christopher Wood, CLSA's Equity Strategist, says that BTC China, based in Shanghai, as well as the largest bitcoin exchange in the world, has risen from about RMB 1 billion by the end of September 2016 to a peak of RMB 8.8 billion at the end of December. China's foreign exchange reserves fell by around 8% in 2016 to $ 3.05 billion in November. This decline occurred as there was a weakening of the 6% Renminbi compared to the dollar in 2016. In this scenario, Bitcoin constitutes a method to escape the government's deflationary measures, increasingly adopted by investors who are discovering more and more ingenious ways to get their capital out of the country. Wayne Zhou, CEO of a multinational in Shanghai, said that the Chinese authorities are constantly changing rules, considering the "unstable" market rules and finding a safer harbor for bitcoin.

Although after the first boom of 2013 it was thought that the bubble of the cryptocurrencies would explode at any moment, it instead reached again high profitability in 2017 regarded by many as the year of the cryptocurrency. Once again, according to analysts to drive the rise of bitcoin, it would have been China behind. The Chinese People's Bank still continues to affirm that behind the capital flight that is destabilizing the Chinese financial and currency market there would be a speculative attack that would have cryptocurrencies at the center. It believes that speculators are changing yuan with cryptocurrencies to export capital abroad (or recycle money) without being tracked. Three bitcoin trading platforms operated in China were put under investigation and this plunged the price of Bitcoin by 12% to $ 909.

The fall, however, has not affected the price of Bitcoin. While the Yuan lost 6.5% this year, (setting a new negative record), Bitcoin has risen by 145% on the Chinese market, where already 98% world volume of digital currency exchanges occurs. According to the government not only Bitcoin is an unregulated or supervised parallel currency market proliferating, but also a "preferential lane" for the illicit export of capital, money laundering and tax evasion. The currency vulnerability is currently limited to the yuan (the price of Bitcoin in dollars is considerably lower), which among other things since last October has

[98] Jonathan Garber, *China is Behind the latest bitcoin craze,* December 30, 2016, available at https://www.businessinsider.com/china-behind-latest-bitcoin-craze-2016-12?IR=T

also become a "reserve currency" for the International Monetary Fund with Dollar, Euro, Yen and Pound Sterling; a status that now appears to be very little substantiated by the reality of facts and markets.

To increase the weakness of the Yuan and bitcoin there are also geopolitical factors: the frontal attack launched by the new American President Donald Trump against China - accused of manipulating exchange rates, creating unemployment in the US and colonizing the American industrial system - generated strong tensions both on the bilateral diplomatic level and on the broader plan of global trade. In this context and in the light of the economic slowdown of the Chinese Dragon has created a climate of uncertainty both on the financial markets and for the same multinationals, with the fear of commercial wars and unexpected taxation. Resuming, although China's ban on cryptocurrencies trading globally affected the crypto-market during the first months, the market rapidly recovered, and the Chinese crypto-market continued its growth in the following years.

2.4 The Boom of the Initial Coin Offering (ICO) in China

Not only the volume of cryptocurrencies has grown in China during 2017; it was also a splendid year for Initial Coin Offerings in the Chinese market: according to the China ICO Development Report for the First Half of 2017 (2017 上半年国内 ICO 发展情况报告)[99] were raised RMB 2.62 billion (which is approximately equivalent to US$400 million) through sixty-five ICO programs operated by forty-three ICO platforms. These figures are extraordinary, especially if we think that before 2017, only five ICO programs were operated in China.

ICO platform in China can be divided into four categories:

- Third-party platform which provides ICO services for various projects;
- Mixed mode of traditional crowdsourcing and ICO, which provides both equity crowdsourcing, ICO services for traditional products and some crowdsourcing platforms begin to transform into ICO platforms;
- Virtual currency transaction + ICO mode, which provides both virtual currency trading and ICO services;
- Other modes, such as Virtual Money Wallet service providers, navigation portal sites to provide ICO, etc.

[99] Report available in Chinese at https://www.ifcert.org.cn/res/web_file/1501062824386085029.pdf

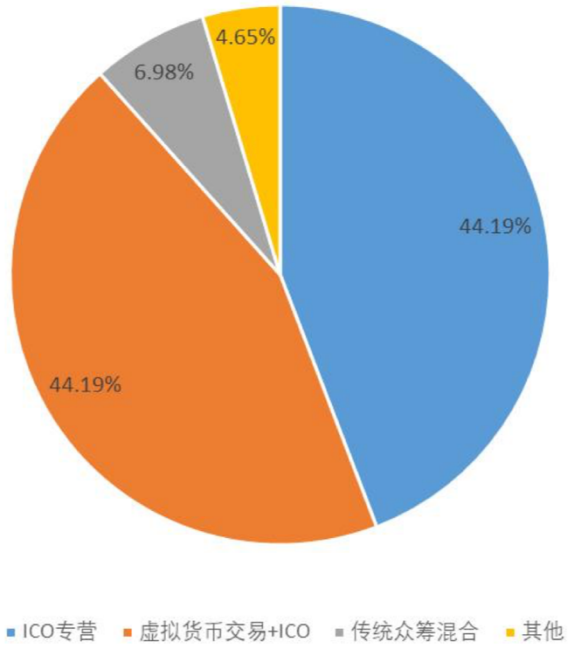

Fig. 24

Types of ICO Platform in China. [100]

The Blue portion represent third-party platforms (44.19%), The orange represents virtual currency transaction + ICO mode (44.19%), the grey the mixed mode of traditional crowdsourcing and ICO (6.98%) while the yellow one represents other modes of ICO.

Guangdong, Shanghai and Beijing are the 60% of the total platform where operators are located. From the perspective of ICO-supported financing currencies, Bitcoin and Ethereum occupy the highest proportion, counting for more than 90% of the total. A small amount of ICO supports RMB and other virtual currencies, such as Ether Classics, EOS, ICO coins, etc.

Most active platforms are ICOAGE from Shanghai (经 营主体为上海趣块信息科技有限公司), ICOINFO whose home is still unknown (经营主 体不明) and ICO365 in Shenzhen (经营主体为深圳众链科技有限公司),that accounted for 30.7%, 22.9% and 10.6% respectively.

Through sampling and analysis of some ICO investment users, from the geographical distribution point of view, Guangdong, Zhejiang, Beijing, Jiangsu and Shandong have the

[100] Image available at https://www.ifcert.org.cn/res/web_file/15010628243860850 29.pdf, page 2

largest number of users, accounting for nearly half of the total users in the five provinces. From the perspective of user gender, male users accounted for 80%, which was significantly higher than female users. From the user age point of view, the user age is mainly distributed as in the image below: between 20 and 49 years of age of which 20-29 year-old users account for 32.1% (the blue one), followed by 30-39 year old users that represent the 31.2% (the orange part) and 40-49 year old users that represent the 16.7% (the grey portion).

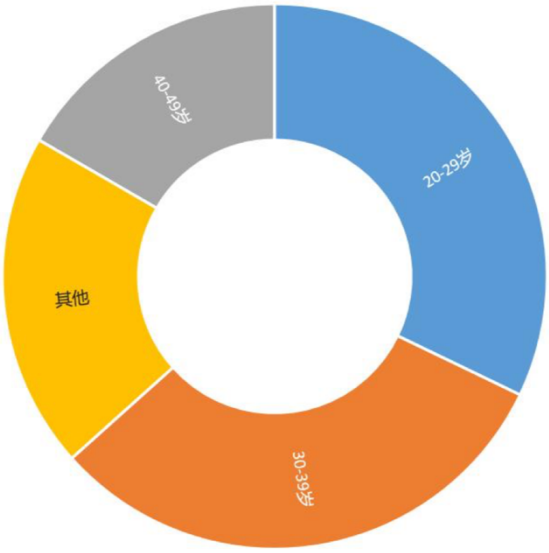

Fig. 25

Age of User that deals with ICO. [101]

Since 2017, the cumulative financing scale of ICO projects completed has reached 63523.64 BTC, 852753.36 ETH and some RMB and other virtual currencies. Converted to zero-point price in July 19, 2017, equivalent to RMB 2 billion 616 million. The total number of participants was 105.000. The following figure gives the ICO financing amount and the time trend of participants. It can be seen that, similar to the frequency of ICO projects on-line, the scale of ICO financing and the degree of user participation also showed an accelerated upward trend.

[101] Image available at https://www.ifcert.org.cn/res/web_file/1501062824386085029.pdf , page 6

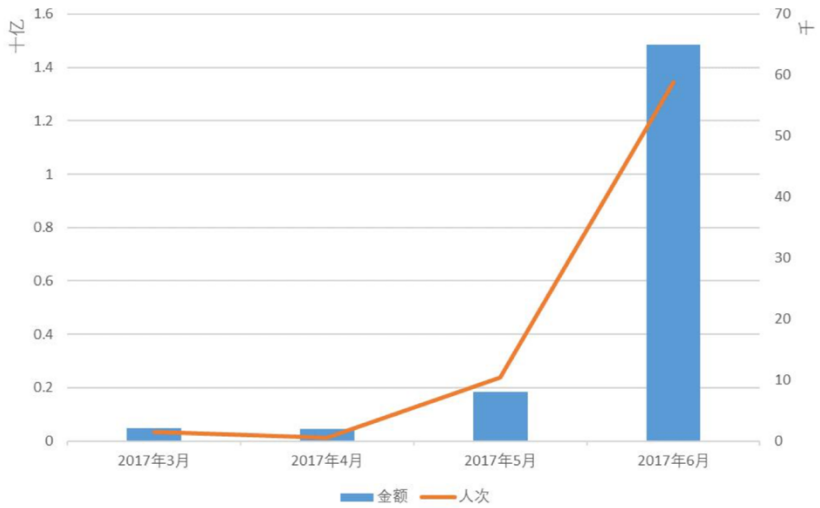

Fig. 26

ICO financing amount and participant time trend between March to June 2017. [102]

Chinese prefer this method of crowdfunding that allow start-ups to collect in a much shorter time the necessary capital to develop their projects in such a way as to avoid the rigorous and not well-regulated capital-raising processes. To regulate the process of the ICOs, at the end of July 2017, according to the China Money Network, six Chinese Blockchain Industry Associations issued the first Chinese ICOs protocol.[103] The protocol was called "Guiyand Blockchain ICO Consensus" released by Guizhou Blockchain Industry Technology Innovation Alliance, Zhongguancun Blockchain Industry Alliance, Blockchain Finance Association, Guiyang Blockchain Innovation Research Institute and two other unnamed entities. [104] This protocol (obviously not issued by the country's official Government Authority) was necessary for better manage and control financial risks of ICOs. In fact, in 2017 ICOs reached impressive volumes: $ 420 million attracting over 100,000 participants. Until August, the government did not take any position on ICOs and this protocol could serve the government to guide the approach towards regulating this phenomenon. Perhaps the government could follow in the footsteps of the Security Exchange Commission in the USA that in July issued a report in which it suggested regulating some ICOs and tokens as securities. In China there are now more than 40 platforms that offer services to create Initial

[102] Image available at https://www.ifcert.org.cn/res/web_file/1501062824386085029.pdf , page 3

[103] Blockchain use, *Chinese Blockchain Association Issues Protocol to Regulate ICOs,* July 26, 2017, available at https://www.ccn.com/chinese-blockchain-association-issues-protocol-to-regulate

[104] Pan Yue, C*hinese Blockchain Associations Issue China's First Protocol to Better Regulate Initial Coin Offerings*, July 26, 2017, available at https://www.chinamoneynetwork.com/2017/07/26/chinese-blockchain-associations-issue-chinas-first-protocol-to-better-regulate-initial-coin-offerings

Coins Offering. Most of them are located in the 3 main cities of China, such as Beijing, Shanghai and Guangdong and together account for 60% of the total platforms.
Unfortunately, the "Guiyang Blockchain ICO Consensus" and the urgency of regulating the ICO phenomenon by investors were not enough for the Government. The government response arrived during the same year, on September 4th, 2017. Indeed, a second official Notice regarding the cryptocurrencies environment was issued, this time specifically addressing ICOs. A full translation of it was carried out for this dissertation and is presented in this section.

2.5 Full text of the “Notice on Preventing Risks from Token Financing”: English version

Seven ministries, including the People’s Bank of China, the Office of the Central Leading Group for Cyberspace Affairs, the Ministry of Industry and Information Technology, the State Administration for Industry and Commerce, the China Banking Regulatory Commission, the China Securities Regulatory Commission and the China Insurance Regulatory Commission, jointly issued the

Notice on Preventing Risks from Token Financing

Recently, a large number of token fundraising activities in the country, including initial coin offerings (ICO-首次代币发行), have emerged for the purposes of financing activities and speculations. Such sales are considered illegal and disruptive to economic and financial stability.

In order to be compliant with the messages conveyed during the National Financial Work Conference, in order to protect the legal rights of investors and prevent financial risks, we have the following announcement:

The statement is based on the law of the People's Republic of China, as well as the laws of the People's Bank of China, Commercial Banking and Securities law, Cybersecurity and Telecommunications law, and Financing and Financial activities law.

1. An accurate acknowledgement of the nature of ICOs.

Token fundraising refers to a process where fundraisers illegally distribute digital tokens to investors who make financial contributions in the form of the so-called cryptocurrencies (虚拟货币)[105], such as bitcoin and ether.[106]

By nature, it is an unauthorized and illegal public financing activity, which involves financial crimes such as the illegal distribution of financial tokens, the illegal issuance of securities and illegal fundraising, financial fraud and pyramid scheme.

Relevant authorities will closely monitor the latest market status and collaborate with the Justice Department and local governments. Altogether, they will strictly enforce the current legal framework to solve the market chaos. Any criminal suspicion will be handed over to the Justice Department.

The tokens or "cryptocurrencies" that are distributed during the token fundraising are not issued by the monetary authority, which has no legal property as fiat currency does and cannot circulate in the monetary market.

2. It is prohibited to any organization or individual starting illegal token fundraising activities (代币发行融资活动).

Starting from the date of this announcement, all kinds of fundraising activities through token issuance should stop immediately.

Organizations and individuals who have completed token fundraising previously shall make arrangements such as refunding crypto assets to investors to protect investor rights and to deal with the risks properly.

Relevant departments will investigate and severely punish those who refuse to halt fundraising activities through token issuance and those whose completed token fundraising actions are found to have violated the law or regulation.

3. Reinforcement of the supervision on platforms that provide exchange services for tokens issued during the fund raising.

[105] In Notice No.289 was used the term 比特币 for bitcoin and cryptocurrencies in general while now a more accurate term is used: 虚拟货币 Xūnǐ huòbì

[106] According to the attributes of bitcoin specified in circular No.289

Starting from the date of this announcement, any so-called token exchange platform should not:

- Be involved in offering exchange services between fiat currency and tokens
- Buy or sell tokens for cryptocurrencies, act as a central party facilitating the trading of tokens for cryptocurrencies
- Provide price bidding or middleman service for the exchange of tokens for cryptocurrency.

For any token exchange platform that violates the law or regulation, financial authorities will request:

- The telecommunication department to shut down its website and mobile application.
- The Cyberspace Administration of China to delist its mobile application from app stores.
- The State Administration for Industry and Commerce to discard its business license.

4. Financial and Non-bank Payment Institutions [107] are not allowed to operate businesses (开展) that deal with token fundraising.

All financial institutions and non-banking payment institutions should not directly or indirectly provide account opening, registration, trading, clearing and settlement services for token fundraising activities; should not underwrite any insurance policy that relates to tokens and cryptocurrency, or include any token and cryptocurrency under the insurance policy coverage.

Should any financial institution and non-banking payment institution be found in violation of the law or regulation, it should be reported to relevant authorities immediately. The public should be highly vigilant about potential risks that come with token fundraising and trading. Token fundraising and trading pose multiple risks, including fraudulent assets, business operational failure, and speculation, etc. Investors are responsible for taking such risks themselves and thus are advised to remain cautious on suspicious projects.

[107] In China, all "non-bank payment institutions" are defined as institutions that are not banks but, with a payment business permission are authorized to provide online payment services. However, its role is limited because according to People's banks of China, transfer in large scale payment are not allowed.

For any illegal financing activity that operates under the name of "coin," the public should become better at spotting scams and always stay vigilant against risks and should report to the authority any infringement of law and regulation violation.

5. The public society (社会公众) should be made aware of the risks of tokens issuing and financing.

There are many risks in the financing and trading of tokens, including those relating to false assets, business failure, investment speculation, and others. Investors must bear the risk of their own investment, hoping that the majority of investors should be cautious in being deceived.

For all kinds of illegal financial activities carried out under the name of "currency", the public should strengthen the awareness of risk prevention and identification ability and timely report relevant illegal and irregular activities.

6. Financial Industry Organizations (行业组织) should be self-disciplined.

All financial industry organizations should carefully study the regulation and have member companies to voluntarily fight against any illegal financial activity that relates to token and cryptocurrency fundraising; stay away from this market chaos; improve the education for investors; jointly maintain the financial stability.

2.5.1 Critical analysis

1. Can tokens and other virtual currencies be classified as goods?

If in the first government's Notice (Yin Fa [2013] No.289) on Preventing Risks from Bitcoin states that "In terms of nature, Bitcoins should be considered specific virtual goods". In the ICO's ban tokens and other virtual currencies are not explicitly classified.
In the Notice, regulators have noticed that the raising of bitcoin, ether and other virtual cryptocurrencies through token issuance constitutes an illegal fundraising activity. Therefore, virtual currencies should not be considered as goods under today's laws. This goes against the definition in Notice No. 289.
This conflict comes out from the changing nature of regulators towards virtual currencies. As a matter of fact regulators have changed the "goods" nature of digital currencies; Though

regulators cannot forget that those who deal with market treat digital currencies as "goods" in relation to token investment, trading and fundraising activities. Finally, we can consider that the Notice has left the nature of digital currencies as they were. It states that virtual currencies such as bitcoin are not real currencies and should not circulate in the market as currencies. In token financing activities, those who raise funds often consider virtual currencies and bitcoin as currencies, committing therefore an illegal action. Summing up, laws that prevent activities that use bitcoin as a currency become inconsistent with the defined nature of bitcoin and all virtual currencies.

In every-day life, virtual currencies are still considered goods and not really non-monetary or financial products. The way laws over illegal financial activities (such as illegal fundraising and illegal security issuance) will be put in practice still remains unsolved.

2. What is the difference between Token financing trading platform, bitcoin trading information intermediary and virtual currency platform?

The Notice forbids "token financing trading platforms" from carrying out businesses related to virtual currencies, although it gives no clear indications of what those platforms are. The Notice underlines the necessity if eliminating illegal public fundraising on order to avoid people from using the special nature of virtual currencies to infringe the law. In other words, not all virtual currency deals become regulated. Being the nature of platforms not clearly defined, we cannot consider all trading platforms related to virtual currencies as "token financing trading platforms".

For example, according to the Interim Measures for the Administration of Bitcoin Trading Activities, the People's Bank of China will increase the classification management of bitcoin trading information intermediaries to acquire regulation-compliant operation. If the scope of token financing trading platforms covered all trading platforms relating to virtual currencies, the bitcoin trading information intermediaries would be prevented from providing services.

So far, platforms providing ICO services in China make use of different business models, in first place third-party specialized service providing platforms and virtual currency trading + ICO model. The scope of "token financing trading platforms" will influence the way regulatory activities are carried out and regulators have to give clear indications as quickly as possible. The last version of the Interim Measures is due to be released in a short time in order to give a precise indication on how to regulate bitcoin and bitcoin trading information intermediaries so as to guide public investment.

3. Illegal ICOs, “regulation-compliant” ICOs and digital asset trading platforms

If we have to consider the two Notice over bitcoin and token financing, we suppose that the most important concern for regulators are illegal issuance to the public and related illegal activities. The Notice underlines that the fundraising of token “involving violation of laws and regulations” will be persecuted.

In the last decade, Chinese Regulators have supported the development of blockchain technology. In the Interim Measures is clear the necessity to include bitcoin trading information intermediaries in the regulatory system through the implementation filing and after-event regulation mechanisms. It will be inevitable in a short time for regulator to implement laws on digital asset trading activities.

4. Are virtual tokens fundraising an illegal activity?

Because in some situations token fundraising projects are virtual, the transfer of virtual currency is found to be independent from financial institutions. As a matter of fact, non-financial payment service providers are deregulated by the State Administration of Foreign Exchange and therefore not illegal.

5. Cross-border ICOs

The Notification still does not provide clear indications on cross-border ICO activities. It underlines only on ICO domestic activities. Because of their nature, ICO activities are difficult to be prevented, especially cross-border ones. For example, if foreign issuers continue to use only foreign websites and social networks and do not commercialize or fundraise in China, they are not subject to regulation in China.

So far what is being regulated is:

- Marketing
- domestic fundraising
- sale agency
- cross-border payments

6. Which are the parties involved?[108]

- Financial and Non-bank Payment Institutions.

In the Non-bank Payment Institutions are included:

1. Payment Service through network
2. Payment Service by prepaid cards
3. Payment Service from POS (Point of Sale)

All the Non-ban Payment institutions are subjected to the anti-money laundry and anti-terrorism requirements.[109]

- Financial Industry Organizations

Fall into this category all the services provided in China by the finance industry such as Banks, Investment Banks, Consumer Finance companies, Credit Card Companies, Insurance Companies, Government Sponsored enterprises and stock brokerages.

- Investors

Investors who participate in ICOs and are not allowed to do it.

2.6 How the China ICO ban impacts the Crypto-market

On September 15, 2017, a working group located in Beijing called the "Beijing Internet Finance Risk Working Group" (北京市互联网金融风险专项整治工作小组办公室) notified the main officials Chinese cryptocurrency trade platform (BTCChina, Huobi, OKCoin, ViaBTC) and all the cryptocurrency platform located in Shanghai and Shenzhen a deadline for ceasing all cryptocurrency trading, to stop registering new clients and prepare a refund plan in order to return asset to clients.[110] The purpose of this communication was to shut down the cryptocurrency exchange and trading, especially those platforms that allowed

[108] Greg Pilarowsky, *China Bans Initial Coin Offerings and Cryptocurrency Trading Platforms*, September 21, 2017, p. 5, available at http://www.pillarlegalpc.com/en/news/wp-content/uploads/2017/09/PL-China-Regulation-Watch-Cryptocurrency-2017-09-22.pdf

[109] Vincent Wang, L*egal Overview of China's Regulation on Payment Service by Non-Financial Institutions,* June, 2013, available at https://www.paymentlawadvisor.com/files/2013/06/Payment-Regulation-Legal-Review.pdf

[110]Greg Pilarowski, Lu Yue, *China Bans Initial Coin Offerings and Cryptocurrency Trading Platforms*, September 21, 2017, p. 4, available at http://www.pillarlegalpc.com/en/news/wp-content/uploads/2017/09/PL-China-Regulation-Watch-Cryptocurrency-2017-09-22.pdf

loopholes to invest in local and foreign ICOs, such as the social platform QQ and WeChat.[111] Remembering that China holds more than 90% of bitcoin transactions and in 2017 65 ICO have launched a fundraising of about $400 million dollars (¥2.6 billion RMB) and accounting for roughly 1/4 of the global ICO market,[112] the impact that the Chinese ban had on the global cryptocurrency market was consistent.[113] If we just analyze the leader market capitalization platforms of cryptocurrencies market have definitely got crush. Cryptocurrencies that have had an incredible rise in the past few months of 2017 have turned back to the values they had before 2017. Bitcoin, where its price went down by 20% and reached $ 4,000. or Ethereum where it even went down to $ 268. In general, more than 80 Altcoins in the top 100 had a consistent decline in those days (fig. 27).[114] Bitcoin and Ethereum are used in China but are not the main platform used in the territory. Neo instead is the most used platform listed in the top ten market cap. and the most affected by the Notice.

Fig. 27

Bitcoin Charts from August 14th to October 8th , 2017. The green line shows its USD price while the blue one Bitcoin's market capitalization. [115]

[111] Samuel Haig, *Chinese Investors Use Wechat Brokers to Bypass ICO Ban*, March 30, 2018, available at https://news.bitcoin.com/chinese-investors-use-wechat-brokers-bypass-ico-ban/

[112] James Vincent, *China bans all ICO s and digital currency launches as 'illegal public financing'*, September 4, 2017, available at https://www.theverge.com/2017/9/4/16251624/china-bans-ico-initial-coin-offering-regulation

[113] CNBN, *Chinese central bank official reportedly says virtual currency trade needs to end*, January 16, 2018, available at https://www.cnbc.com/2018/01/16/peoples-bank-of-china-virtual-currency-trade-report.html

[114] CCN, *Ethereum, Bitcoin Prices Continue to Tumble Following China ICO Ba*n, September 5, 201/, available at https://www.ccn.com/ethereum-bitcoin-prices-continue-tumble-following-china-ico-ban/

[115] Available at https://coinmarketcap.com/

Fig.28

Ethereum Charts from September 3th to 7th. The green line shows its USD price, the blue the market capitalization and the yellow one the corresponding Bitcoin price. [116]

The most obvious short-term impacts were: [117]

-**The continuous volatility of the cryptocurrencies in the market.** The price of coins continued to be characterized by high volatility, due to the circulation of false news on the web and the misinterpretation of the ban. In this regard, it is good to specify that the government's decision to ban ICOs is not definitive but only temporary and private sales are permitted. The government encourages and supports the search for blockchain technology and it was also mentioned in the 13th Five-year Plan (2016-2020) at the end of 2016. Hu Bing himself, a researcher at an Institute of Finance and Banking supported by the Chinese government, said in an interview with CCTV (Chinese national television) that the decision by the Chinese authorities is temporary.[118] In particular, he stated that the government did not prohibit them but temporarily paused them, with the intention in the immediate future of making them legal through a licensing program. In fact, if the government will legalize the ICO, their license could be similar to the BitLicense[119] program in New York. The ICOs will then be relaunched as soon as regulatory frameworks are present.[120]

[116] Supra note 116
[117] Soravis Skrinawakoon, *Our views on Chinese ICO Ban-its impacts and what you can do*, September 9, 2017, available at https://medium.com/cryptobro/our-views-on-chinese-ico-ban-its-impacts-and-what-you-can-do-2c16182446be
[118] Maria Konash, *Chinese Official: ICO Ban in China is Temporary*, September 11, 2017 available at https://www.coinspeaker.com/2017/09/11/chinese-official-ico-ban-china-temporary/
[119] BitLicense is a business license for using cryptocurrencies with a lengthy list of terms and conditions. More information available at https://cointelegraph.com/tags/bitlicense
[120] Joseph Young, *China Ban on ICO is Temporary, Licensing to be Introduced: Official*, September 10, 2017, available at https://cointelegraph.com/news/china-ban-on-ico-is-temporary-licensing-to-be-introduced-official

- **Decreased demand for ICOs.** Surely this decision by the Chinese government could make a more cautious attitude on the part of investors. And of course, less ICOs means less demand for cryptocurrencies.

-Follow-up of other nations. South Korea, following the ban on China, on 29 September has banned all ICOs in the country so that no ICO type will be allowed. The Korean Financial Services Commission cited the growing risk of fraud as a reason behind the ban for fear of even more financial fraud. The trading activities linked to digital currencies such as Bitcoin and Ethereum will also have to be monitored more strictly from now on. The South Korean government does not believe that cryptocurrency trade should be accepted as an integral part of its financial system.[121]

-ICOs moving out of China. After the ban in September 2017, enterprising Chinese citizens (and South Korean citizens too) have opened bank accounts in Hong Kong (a region under political control from China but that follows a different legal and regulatory structure) considered as the new Mecca of cryptocurrencies.

ICO Ban Casualty Report - Exchanges		
Exchange	Delisting Tokens	Delisting Date
Yunbi	QTUM, GXS, EOS, ANS (NEO), DGD, 1ST, GNT, REP, SNT, OMG, PAY, LUN, VEN	2017/9/6
BTER	ICO, LLT, QTUM, OMG, PAY, SNT, STORJ, CVC, ZRX, BAT, TNT, DNT, XTC, TIX, XCP, REP, BTM, CNC, DOC, EOS, ETP, LRC, PST	2017/9/6
Jubi	UGT, ELC, ICO, QTUM, HCC, BTM, ACT, BTK, EOS, XNC, TIC	2017/9/9
51SZZC	TIC, NEO	2017/9/7
coinvc	SIP, ICO, CCC, YLC, ATT, BCDN, MVC	2017/9/7
B.TOP	ETP, CPC, BTK, ELC, FID, MKC, BL, IPC, TIC, GXS, DOC	2017/9/7
Dahonghuo	HCC, XNC	2017/9/6
BTC9	Recent ICO related tokens (not yet specified) http://www.btc9.com/Art/details/id/525.html	TBD
Yuanbao	Recent ICO related tokens (not yet specified) https://www.yuanbao.com/news/detail/?id=1566	TBD

Fig.29

Initial Coin Offering Ban in China: Most of the token ban were cluttering the ICO market. We could say just EOS, NEO and OMG are interesting White Paper. [122]

[121] Rachel Rose O'Leary, *South Korean Regulator Issues ICO Ban*, September 29, 2017, available at https://www.coindesk.com/south-korean-regulator-issues-ico-ban/

[122] Image available at https://twitter.com/cnledger/status/906111094380302337

Several Chinese issuers based in China had moved abroad after the ban but continued trading their product to Chinese investors using subsidiaries overseas to launch their ICOs.[123]

However, some ICO analysts think the ban can have positive impacts on the crypto-economy world.

1. Advantage for the US.

For potential US companies, the ban could be an opportunity to become fintech/technology innovators in this field. Therefore, startups that want to attract capital will continue to choose the US.

2. Positive effect on Bitcoin and Ethereum.

Due to the decrease in the Chinese territory of the ICO, Ethereum and Bitcoin will be more quoted because the new Chinese ICO's coming into the market are not released via NEO anymore but are "diluted" between Bitcoin and Ethereum.

3. ICOs will require greater anti-money laundering (AML)[124] and Know-Your-Customer (KYC) process.

In General, KYC,[125] identifies financial diligence activities, that have evolved and developed, to be a necessary and unavoidable presence in the contractual relationships concerning financial transactions. It consists in finding adequate financial and non-financial information about contracting parties in order to avoid harassment of risk or damage to economic reality. This results in the protection of the parties in relationship that in banking and financial matters is expressed through the collection of all information useful for preventive assessments on the possible scenarios of a deal and, more specifically, in situations where the reports provide for movements of money, transactions and investments between banking institutions on the one hand and customers on the other. In the field of cryptocurrencies, KYC are blockchain users' verification and is the only way it can check the identity of each user and the source of funds raised during token sales, the company that produces the digital currency, makes sure that any transfer made using the protocol is not anonymous. All submitted identity documents remain confidential. Each user must go

[123] Kevin Helms, *Hong Kong and Singapore Emerge as New Meccas for Token Sales*, April 24, 2018, available at https://news.bitcoin.com/hong-kong-singapore-meccas-token-sales/
[124] Yuan Li, *China's ICO ban is a strong bullish signal*, September 7, 2017, available at https://medium.com/@sourireli01/chinas-ico-ban-is-a-strong-bullish-signal-45d741d829c5
[125] Roger Haenni, *Understanding IDentify Verification (KYC) for ICO Token Sales*, November 26, 2017, available at https://blog.datum.org/why-datum-requires-identity-verification-for-our-token-sale-159dcfb139d0

through a verification procedure each time his identity information is requested. The information requested by the KYC includes name, surname, residential address and date of birth / country, etc. KYC could help government to fight Anti-money Laundering (AML), terrorism, scams, etc.[126] In other words, the KYC procedural rules all have the same purpose: to limit operational risk by eliminating anti-money laundering and terrorism financing. In this respect, ICOs need to know who their customers are, the source of revenue and where the transactions take place. In fact, a company must be aware of the information relating to the customers with whom it is in business. As in the ban the Chinese government warn business entities and investors of possible fraud through cryptocurrencies, it will surely increase greater control towards ICO crowd sales by Chinese business entities.

4. Private crowdfunding sales will increase.

As said before, private sales are allowed in China while public sales are banned. Private sale[127] can be defined as an activity between founders and investors where they have the pitch projects to crypto funds and then we have the ICO token distribution. Usually the company makes a pre-ICO sale to test if investors will invest or not in the project.

5. This event could further accelerate blockchain technology development projects in China.

As we will see in Chapter 3, the fact that China's Government issued a ban on ICOs, doesn't mean that China is not interested in blockchain technology, but is embracing a "blockchain before bitcoin" policy, focusing less on ICOs and trading, and more on the blockchain technology itself.

Finally, we observed that government-monitored ICOs have managed to close the crowd-sale after the issue of the second ban too, and at the end of the year there will be room for the pre-sale of other Chinese ICOs.[128] Many analysts propose that it could just happen what already happened when the cryptocurrencies trading was banned in 2013 when, after an initial decline of coin values, they came out stronger than before, reaching unprecedented levels.

As already happened for the first Chinese Bitcoin's trading ban, despite the considerable efforts by the Governments to shut down all forms of ICO activities in China, citizens have already found a way to avoid Chinese prohibitionist policies. In general, it is worth observing that in China almost every commodity becomes object of speculation. Thanks to the fact that

[126] Definition by COINTELEGRAPH, available at https://cointelegraph.com/tags/kyc
[127] Aleksandr Fedotov, *What is a private presale/pre ICO*?, January 12, 2018, available at https://www.quora.com/What-is-a-private-presale-pre-ICO/answer/Aleksandr-Fedotov-2
[128] Here a list of the Chinese ICO crowd sale and pre-sale: http://52ico.com/

in China the cost of electricity is among the lowest in the world and capitals can be easily raised through ICOs, together with the fact that crypto transactions can be carried out in semi-anonymity, it could be difficult for Chinese authorities to enforce the ICO Regulation in an effective manner, just as happened in 2013. The ban was probably successful in eliminating frauds and fraudulent ICOs that had damaged the Chinese market in the past[129], but stopping and permanently eliminating the phenomenon in such a vast country as China, would require a huge effort by the Chinese Anti-Money Laundering Authority.

[129]Btcmanager.com, *China Crypto Crackdown Is a Much Needed Cleanse, Says NEO Founder*, April 2018, available at https://btcmanager.com/china-crypto-crackdown-is-a-much-needed-cleanse-says-neo-founder/

Chapter 3- Possible scenarios

3.1 Neo and the Chinese Government: is a collaboration possible?

The Chinese government's ban of course did not help NEO at all. The "Chinese Ethereum" in 2017 become the world's sixth largest coin in August, with a price nearing $150 and a total market valuation of $2.283 billion.[130] NEO used to have around $35 in August 2017 while between the 4th and 5th of September the price crashed touching almost $17 and it has been a long and hard road to recovery. Indeed the 2018 was not a good year for NEO.

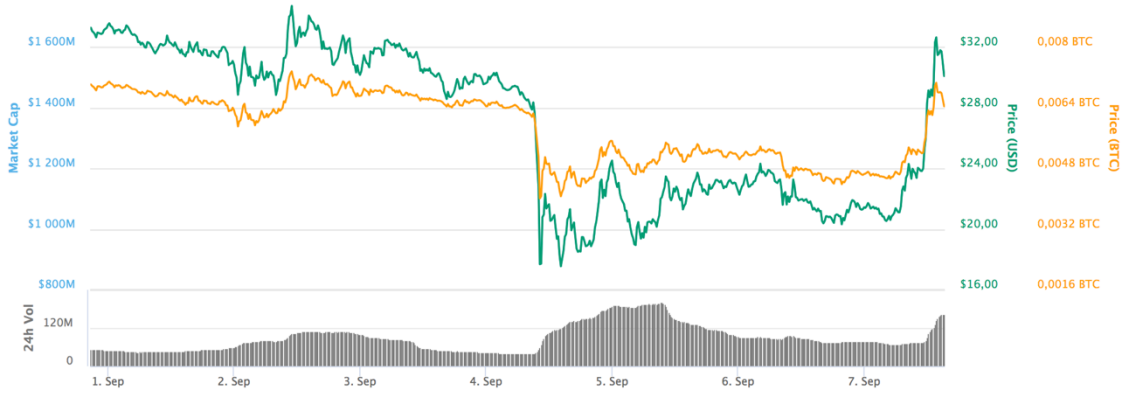

Fig.30 NEO Market Cap September 1- 7, 2017. It can be seen as its price between the 4th and 5th September fell down due to the Chinese ICO's ban. [131]

Both before and after the 2017 ICO's ban, the Chinese government seems to have acted in an ambivalent way with NEO.

In September 2017, immediately after the ban, Da Hongfei, the founder of NEO, admitted that few months before the Chinese government's decision on ICO ban he had a meeting with the authorities to discuss possible future cryptocurrencies market regulations. Da affirmed that he supports the Chinese government's decision to ban ICO from the market because lots of crowdfunding were "fakes and fraud".[132] Da strongly believes that an integration with NEO platform within China's blockchain infrastructure is possible, in fact he added: "I do not expect the government to call me in the short-term and say, 'Let's use NEO as the blockchain technology infrastructure of China.' But in the medium term?

[130] Nick Hall, *NEO: Is China Holding its best Blockchain asset back?*, August 1, 2018, available at https://cryptobriefing.com/neo-china-blockchain-hold-back/
[131] Source: https://coinmarketcap.com/
[132] TheCoinEconomy, *NEO Founder, Da Hongfei, Advised China on ICO &Exchange Ban-Says Govt. Collaboration is 'Possible'*, September 26, 2017, available at https://medium.com/@TheCoinEconomy/neo-founder-da-hongfei-advised-china-on-ico-exchange-ban-says-govt-4631b9f7971

Why not? I think it's possible." From this declaration seems that in the near future NEO could become the "Chinese's Crypto". What seems to have changed route to the Chinese Government are some "contradictory" positions taken immediately after the ICO ban.

3.1.1 Is the Government changing his mind on NEO?

On September 4th , 2017, the Chinese News government web-site (中华人民共和国中央人民政府)released an article in favor of the development of blockchain technology projects that was deleted immediately after. In this article few projects are mentioned in collaboration with NEO and other research laboratory based in Beijing, Shenzhen, Shanghai and Hangzhou. It seems that Chinese Officials understood the idea that cryptocurrencies need blockchain but blockchain does not need cryptocurrencies. It is not clear why this article was deleted but is clear that the top officials have conflicting opinions and a final decision has not been taken.

During an intervention at the nineteenth edition of the annual conference organized by the Chinese Academy of Sciences, President Xi Jinping publicly called the blockchain a "breakthrough" technology, defining it as a perfect example of "new generation technology" that "will lead to significant progress in the future."[133] "A new generation of technology represented by artificial intelligence, quantum information, mobile communications, internet of things (IoT) and blockchain is accelerating as breakthrough applications," he said.[134]

During a conference held in Beijing on May 11, 2018, the Chinese government announced the publication of a monthly "independent analysis" on cryptocurrencies and blockchain projects. According to the press that released the announcement, the China Electronic Information Industry Development Department (CCID) and the Chinese Ministry of Industry and Computer Science, will analyze 28 cryptocurrencies including Bitcoin, Ethereum, Litecoin, Monero, NEO, QTUM, Ripple and Zcash.

Various high-level experts will contribute to the project, entitled by the creators "Global Public Chain Assessment Index". The index aims to fill the absence of a rating system for cryptocurrencies and blockchain projects in China.

Although the initiative certainly does not abolish the trading ban imposed by the Chinese government, it still represents an excellent publicity for cryptocurrency assets. Regarding

[133] Chinese article by Xinhua.net (新华网)，习近平：在中国科学院第十九次院士大会、中国工程院第十四次院士大会上的讲话, available at http://www.xinhuanet.com/politics/2018-05/28/c_1122901308.htm

[134] Evelyn Cheng, *Chinese President Xi Jinping call Blockchain a 'breakthrough' technology*, May 30, 2017, available at https://www.cnbc.com/2018/05/30/chinese-president-xi-jinping-calls-blockchain-a-breakthrough-technology.html

the position of the government, the CCID statement focuses on the technology on which the cryptocurrencies are based, demonstrating "the Chinese government's confidence in this technology"[135].

CN Ledger, a popular Twitter manager, was the first to expose the list to the outside world (fig. 31). The Information Industry Development Center used three main criteria in the cryptocurrency score (Technology, Application, Innovation), but the list seems not clear and there is limited information on the methodology chosen. These three criteria have been used to list 28 total cryptocurrencies and their respective blockchain technology (which weigh heavily). Of the top four coins by market capitalization we have Ethereum, ranked first, bitcoin (BTC) ranked 13, Ripple at 17th place, and bitcoin cash (BCH) lagging behind. For the CCID, however, the five best cryptos are Ethereum, Steem, Lisk, NEO and Komodo.[136]

Public Blockchain Ratings by CCID, China's Ministry of Industry & Information Technology

Project	Sub-Index			Total Index	Ranking
	Technology	Application	Innovation		
Ethereum	80.3	23.7	25.4	129.4	1
Steem	82.6	9.4	23.9	115.9	2
Lisk	64.4	20.9	19.5	104.8	3
NEO	69.2	26.6	7.3	103	4
Komodo	60.3	12.8	28.5	101.5	5
Stellar	70.8	18.1	11.8	100.7	6
Cardano	60.3	13.7	24.3	98.2	7
IOTA	65.9	14.9	17.4	98.2	7
Monero	65.7	11.1	15.8	92.6	9
Stratis	60.2	19.3	12.2	91.7	10
Qtum	58.3	22.8	10	91	11
BitShares	71.6	12.3	7	90.8	12
Bitcoin	39.4	13.1	35.6	88.1	13
Verge	66.1	10.9	11.1	88.1	13
Waves	58.2	12.3	16	86.5	15

16-28: ETC, XRP, DASH, SC, BCN, LTC, ARK, ZEC, NANO, BCH, DCR, HSR, XEM

Fig. 31

Top 15 Public Blockchain according to China (Phase 1) [137]

[135] China Electronic Information Industry Development department, *我院组织召开公有链技术评估专家研讨会*, May 11, 2018, Chinese article available at https://www.ccidgroup.com/gzdt/11333.htm

[136] Chinese article available at http://www.cena.com.cn/ia/20180517/93332.html

[137] Available at https://coincentral.com/chinese-govt-releases-crypto-ratings-ethereum-comes-in-first-while-bitcoin-lags-behind/

This Chinese cryptocurrency list appears confused.

Anonymity-focused coins included in the list such as Verge (ranking 14th) contradicts the recent Government position while the notion of anonymity (that is one of the main differences between Ethereum and Neo) doesn't seem to have affected the ranking. Additionally, the relevance of being China-based for NEO seems to be irrelevant. It seems that the list is not assessing the legalities of each crypto within their framework.

China, once again, attributes value to currency-chains, a common element taken from the Western corporate world. If various cryptocurrencies would have been evaluated on the basis of their effectiveness as a medium of exchange, BCH and BTC would be classified as rather high and could be considered a more obvious threat to a control-oriented regime.

At the end of June, the China Electronic Information Industry Development updated its blockchain rankings (fig.32).[138] In the new list EOS managed to undermine Ethereum (ETH) from first place. The new ranking claims EOS as the best blockchain network in the world of technology and innovation. However, EOS did not take a good mark in the applicability field, that is the easiness of applying the technology to the real world.

Name	Dimensions			Overall Index	Rank
	Technology	Applicability	Innovation		
EOS	102	15.4	44.1	161.5	1
Ethereum	85.2	24.9	28.3	138.4	2
NEO	73.7	27.4	7.9	109	3
Stellar	78.1	21.2	9	108.3	4
Lisk	66.7	20.8	18.1	105.3	5
Nebulas	73.5	21.1	10.7	105.3	6
Steem	86.9	7.5	10.1	104.5	7
BitShares	82.3	10.9	10.9	104.1	8
Ripple	77.1	9.4	16.4	102.9	9
Qtum	59.9	24.1	16.3	100.3	10

Fig. 32

Top 15 Public Blockchain according to China (Phase 2). [139]

The first 5 blockchains for technology evaluation are EOS, Steem, Ethereum, Bitshares and Stellar, respectively. As far as applicability is concerned, the classification says: NEO, Ethereum, Qtum, Stellar and Nebulas in this order. In terms of pure innovation, EOS is always at the top of the list followed by Bitcoin, Cardano, Ethereum and Litecoin. It is still

[138] CCN, *China Ranks EOS as the #1 Blockchain, Bitcoin Doesn't Make Top Ten*, June 25, 2018, available at https://www.ccn.com/china-ranks-eos-as-the-1-blockchain-bitcoin-doesnt-make-top-ten/

[139]

amazing to see the position assigned to Bitcoin, which is able to worsen the already not very good ranking. Bitcoin has moved from the 13th to the 17th place. Bitcoin Cash also fell slightly from the 25th to the 28th place. It is interesting to note that EOS in the previous ranking was not even present in the list and in the new one was put at the top of the ranking. The new-entry (compared to the previous ranking) is Nebulas which was classified with an excellent sixth place.

Moreover, at the end of July 2018, the Xiongan government located in the Hebei province, the new economic zone in charge of building the President Xi Jinping's project announced in 2017, has chosen the New York-based Ethereum blockchain studio ConsenSys over NEO. [140] The studio ConsenSys, founded by Joseph Lubin, is composed by experts and entrepreneurs and turns out to be the largest organization in the world dedicated to Ethereum and 3.0 Web platform.[141] The American organization has entered in a Memorandum of Understanding (MOU) with the 'Smart City'. Previously Xiongan's local government, and the Chinese territory in general, has collaborated with only Chinese firms such as Tencent, Ant Financial and Qihoo 360 in order to bring blockchain use in the project. So, the ConsenSys turns out to be the first American firm entering in a Chinese project.[142] If from one side this signals stated how China wants hardly to develop blockchain technology, appears strange why Xiongan did not choose NEO. The choice could be defined "Monumental"[143] . The Chinese government has always been reluctant to collaborate with foreign company, especially the USA, historical "enemy" in the field of economic competition since ever. Facebook, Youtube, Google, and all American company are banned in China in order to ensure Chinese platforms such as We-Chat, Baidu, and so on. So why choose NEO over Ethereum? Unfortunately, we do not have official response or communication over the matter but what is sure is that ConsenSys already has agreements with NEO and so the choice could have been made in order to better implement the blockchain networks and increase its adoption.

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[140] Rachel Rose O'Leary, *China's Central Bank Visits US on Blockchain Research Trip*, August 29, 2017, available at https://www.coindesk.com/chinas-central-bank-visits-us-blockchain-research-trip/

[141] Michael K. Spencer, *What is ConsenSys?,* July 23, 2018, available at https://medium.com/futuresin/what-is-consensys-a5ef3f963ddb

[142] Michael K. Spencer, *Ethereum enters in China in 'Smart City' of Xiongan via ConsenSys*, July 25, 2018, available at https://medium.com/futuresin/ethereum-enters-china-in-smart-city-of-xiongan-via-consensys-c6c868e5fa61

[143]Joseph Young, *China's Decision to Choose Ethereum Over its Own Blockchain NEO is Monumental*, July 25, 2018, available at https://btcmanager.com/chinas-decision-to-choose-ethereum-over-its-own-blockchain-neo-is-monumental/

3.1.2 Why choosing NEO could be the best option for China: the OnChain Project

Neo has a huge key advantage that, at the moment, other platforms do not have: the OnChain project.[144]

The founders of NEO, Da HongFei and Erik Zhang, in February 2014 founded a company based in Shanghai called OnChain. Understanding the OnChain is fundamental to understand NEO, as the two projects share the same long-term interests and are in a partnership together.

The OnChain system, known as DNA (Decentralized Network Architecture), was in response to the attention received from Chinese private companies in order to work with them and the Chinese Government. It took almost two years of Research and Development to start providing services to their first customers. The first Whitepaper on consensus protocol from China was finally released in April 2016. This protocol used by NEO is called the dBTF (delegated Byzantine Fault Tolerance) protocol, a type of system (algorithm) used to manage consensus in blockchains.[145] NEO acts as the foundation of DNA. If OnChain can integrate with Chinese companies and government, this will stimulate the adoption of NEO. In other words, DNA develops public and private blockchains for businesses and these blockchains are connect to NEO in order to join the decentralized economy. The companies therefore have all the advantages of both public and private blockchains: they can connect and get the best from both worlds.

In 2016 OnChain started seeing some high-speed velocity. It became the first Chinese blockchain company to join Hyperledger, a project by Linux Foundations that focuses on the development of private and public businesses. On that occasion, NEO's founders kept in contact with Fabric, the Hyperledger's platform for distributed ledger solutions. It helped them to develop and design many aspects of DNA. In the same year, in June, after the creation of many important partnerships with Microsoft China (in order to integrate the technology with Microsoft's voice and face recognition) and FaDaDa (法大大- an online platform that offers services of online electronic contracts signature, electronic documents signature, evidence custody, etc[146]) Legal Chain was founded that aim at targeting the inadequacies of digital application within the legal system. All this was possible thanks to

[144] Ron See, *The company behind NEO: Onchain and its ultimate plan- DNA*, September 11, 2017, available at https://hackernoon.com/neo-onchain-and-its-ultimate-plan-dna-4c33e9b6bfaa

[145] Dictionary, *dBFT- delegated byzantine fault tolerance*, December 29, 2017, available at https://www.cryptoclubitalia.it/dbft-delegated-byzantine-fault-tolerance/

[146] For more information, see the Chinese website at https://www.fadada.com/

the 电子签名法 (*Diànzǐ qiānmíng fǎ*, the Digital Signature Act) that in 2005 passed into a national law bringing the digital signature at the same level as the real one. After that, OnChain company was listed in the KPMG's top 50 Fintech companies in China and it started the first relationship with the Japanese Ministry of Industry, Economy and Trade. In December 2016 it was announced a partnership with Alibaba and OnChain. This alliance was made in order to provide a proof of existence for a blockchain- powered email for enterprise level use, made possible by the merge of Ali Cloud email service and Legal Chain.

In 2017 a strategic alliance was made between OnChain and -King Technologies (a subsidiary of a Fortune's 500 company HNA Group) in order to explore the DNA's application for private enterprises. Then the Guizhou Government (that has now in China the big data top industry) started a collaboration with OnChain to develop Identify Chain (a project to make digital identity). Finally, one of the Chinese private conglomerates, the Fosun Group, has invested into OnChain in order to apply DNA in its businesses.

By analyzing the behavior of the Chinese government, it can be affirmed that it is usually with organizations or against them. It has never taken a neutral position. If NEO operates with the government, then it is probably with them and, in order to build a solid blockchain project, it is very important for China and the Chinese government to come across a stable partner. According to the Chinese Government's ICO ban issued in September 2017, NEO token is currently forbidden in China but not the use of blockchain. The bound with OnChain, NEO's project, gives NEO more value/legitimacy than any other dApp platform available at the moment. The two entities are almost the same. It makes sense that private organizations with blockchain related aspirations and solutions can deal directly with Onchain and with their own chain. Therefore, the organization can continue to make profit while being accessible to the wider community of Crypto via NEO. This is exactly how the Smart Economy should work according to Da Hongfei vision.

The reality is the community-based development of NEO that facilitates a "faster-than-Ethereum" rate of implementation and ecosystem adaptation. The bigger the community, the more reliance there is on NEO / OnChain.

NEO is a Chinese product and a positive aspect for NEO's future, and it is quite obvious that if NEO will collaborates with the government it may give them strength and major authority in the near future. Let's see what will happen.

3.2 Chinese Government's future blockchain projects

In May 2018, during a speech at the Economic Information Daily 经济参考报 (*Jīngjì cānkǎo bào*) of Xinhua, the director of the Blockchain Research Department- Li Ming- revealed that a study group started working in a project in which various government agencies will participate to release national standards in the blockchain sector (国家标准测试的区块链系统- Guójiā biāozhǔn cèshì de qū kuài liàn xìtǒng) . The project will be called "Blockchain and Distributed Accounting Technology Standardization Committee" which is expected to be completed by the end of 2019. Li Ming revealed that the blockchain national standards will include:

- basic standards;
- business and application standards;
- process and method standards;
- credibility and interoperability standards
- information security standards, etc.,

and will further expand many blockchain applications.

-Projects by economic parties.

Yu Kequn, director of the National Information Technology Security Research Center, said at the 2018 Blockchain Security Summit, that the development of blockchain technology will become an important step for China to grasp the opportunities of global science and technology competition and he also pointed out, that the blockchain is believed to lead a new round of technological innovation and new industrial development.[147] Blockchain technology, as a new integrated application of distributed data storage, peer-to-peer transmission, consensus mechanism, encryption algorithm and other technologies, has the characteristics of decentralization, openness, tamper resistance and anonymity. It can be applied in the production, management and transaction chains, which will bring the entire life cycle reconstruction to different fields, so that the life cycle can be managed and traced. In fact, BAT (China's triangle giant firms Baidu, Alibaba and Tencent) has already begun to lay out blockchains:

[147] Sharat Chandra, *China to set up national blockchain and blockchain standard*, May 10, 2018, available at https://bcfocus.com/news/china-to-set-up-national-blockchain-and-blockchain-standards/8930/

1. Alibaba has partnered with PricewaterhouseCoopers to announce the application of blockchain and create a transparent and traceable cross-border food supply chain.[148]
2. Tencent and the China Federation of Logistics and Purchasing signed a strategic cooperation agreement, officially landing the logistics scene.
3. Baidu Finance and other financial institutions jointly released ABS (asset-backed security) projects supported by blockchain technology, with a scale of 424 million yuan.

However, there are many challenges to its security issues. The Blockchain Industry Security Analysis Report, released by the White Hat Exchange Security Institute, shows that, from 2011 to April 2018, losses due to blockchain security incidents worldwide amounted to $2.864 billion. In the past two years, the amount of related losses has increased exponentially. Since 2018, the amount of losses has reached 1.9 billion US dollars.

-Projects by financial parties.

In the financial field, People's Bank of China (PBoC), China Construction Bank (CCB), Industrial and Commercial Bank of China (ICBC) and the Agricultural Bank of China (ABC), have also begun to develop blockchains for:

- poverty alleviation;
- international trade;
- housing leasing platforms;
- e-commerce supply chains;
- service areas in Xiong'an New District.
-

ICBC pointed out in its annual report that, it actively explores application scenarios such as blockchain, artificial intelligence, IoT (Internet of Things) and uses blockchain technology to promote transparent management of construction funds in Xiong'an New District. CCB proposes to take the lead in realizing domestic credit in the industry. Inter-bank and cross-border application of blockchain in the field of:

- International insurance and factoring;

[148] Zheping Huang, *China's crackdown on crypto hasn't stop its tech giants from flirting with blockchain*, April 20, 2018, available at https://qz.com/1256536/baidu-tencent-alibaba-bat-are-flirting-with-blockchain-despite-chinas-ban-on-cryptocurrency/

- Agricultural Bank applies blockchain technology to e-commerce supply chain finance;
- Promotes the construction of financial digital point system to create blockchain integration system.

Bank of China launches trade financing Blockchain applications and biometric technology applications such as fingerprints, finger veins and voiceprint certification. Hen Yunshi, general secretary of China's cloud system industry innovation strategy alliance, said that IBM (International Business Machines), an American multinational technology company, symbol of US technology strength, also bet on blockchain.[149] In its 2016 report, it predicted that 65% of banks will use blockchain technology within three years.

Hu Guangjun, deputy director of the Information Security Department of the First Institute of the Ministry of Public Security, said that in the future, the physical world and the relationship with people will be included in the entire blockchain ecosystem. He revealed that the department is currently considering how to apply blockchain technology to the public security field.

According to Deng Huan, head of the White Hat Exchange Security Institute, the value of the information economy continues to rise and uses a variety of ways to obtain more sensitive data. "At present, the most widely used virtual currency in blockchain technology has been exploited by hackers to cause huge losses."

In this regard, Zhao Wu, founder of Beijing Huashun Xinan Technology Co., Ltd., said that although the blockchain has subversive technological potential, it must realize that the blockchain is still in its infancy and far from reaching the stage of subverting the world. Yu Kequn stressed that the independent and controllable blockchain network is not technically acceptable to people and can also promote the healthy development of blockchain.

Security is the future life of the blockchain. Only its own security can make the blockchain technology fall. This requires China to develop the security attributes of the blockchain technology at the same time, and even advanced development.

Li Ming also said that an important part of the standard is the standard of information security, and the importance of security for blockchain technology can also be seen. He also pointed out that the formulation of blockchain standards does not mean that it will promote the development of the industry quickly but give the industry certain guidance. Previously,

[149] More Info available at https://www.ibm.com/blockchain

China had suffered a lot in international intellectual property rights and standards. In terms of blockchain, China has now formed more than 200 patents in the international blockchain and has even stood at the forefront of world technology.

However, the aim of the initiative is not to rapidly advance the development of the blockchain industry in China, but simply to provide clear guidance to the industry, as Li explained during his speech.

Finally, according to the Financial News on July 31st, the Agricultural Bank of China (ABC), one of the most important banking institutions in the world, has successfully completed its first loan on the blockchain network. ABC, officially owned by the Chinese government, has revealed that it has granted a loan of about $ 300,000: these funds will be guaranteed by a plot of agricultural land in the province of Guizhou. The bank will collaborate with the local population in the construction of buildings, farmland and resource management offices thanks to the use of blockchain technology. Part of the funds will also be allocated to support the local tea industry.

This project will also involve third-party institutions, including the provincial division of the People's Bank of China which will confirm the validity of the transaction data. Thanks to the blockchain technology, it will be possible in the future to prevent the problem of citizens applying for loans in various banks providing the same ground as a guarantee.

These are in general the most relevant Chinese's blockchain macro-area of using the technology in the near future and appear extremely clear its vision to apply and invest in it. What instead remains uncertain is:

1. What if China regulates cryptocurrencies?
2. What if the Government releases its own cryptocurrency?
3. What if the Chinese Government centralizes Blockchain?

We will try to answer shortly and give a general panorama of the "what if" scenarios.

3.2.1 What if China allow the trading of bitcoin and the cryptocurrencies market.

It is really unlikely that China's Government will decide to remove the bans on the cryptocurrency market in the near future and provide a set of guidelines to legalize the phenomenon, because there is a strong reluctance to accept non-domestic products (as we have seen), and above all because cryptocurrencies are seen as a source of financial risk, linked to frauds and to the phenomenon of capital evasion abroad. However, due to the

uncertain and not well-regulated field, it is also possible (even if unlikely) that China will decide to legalize the phenomenon in the end.
Considering that today China holds more than 95% of cryptocurrencies trading[150], if the Bank of China (and therefore the government) would decide to regulate cryptocurrencies and bitcoin exchange markets, there is a high probability that the Asian zone, together with Honk- Kong, Japan and South Korea (which currently holds the highest number of Ethereum transactions), will become the main reference point for trading cryptocurrencies, a real power-house area.

Furthermore, adequate regulation by the government, if implemented, could:

- eliminate the many scams present (especially with regard to ICO projects);
- create a more equitable and stable situation for the financial companies within the countries;
- have greater protection for investors and users who use crypto-transactions;
- "re-acquire" the large number of traders migrated from China and from the governments where the cryptos are not regulated.

In the long term, if the Chinese Government will decide to regulate its crypto-market, a government's roadmap towards the creation of a national cryptocurrency program will be immediately released. Trade in cryptocurrencies will receive licenses to operate as regulated financial service providers and will be treated fairly as legitimate financial companies within the country.

3.2.2 What if the Government releases its own cryptocurrency

After the news released by the government, that is that China has invested $ 1.6 billion in blockchain technology, it is spontaneous to ask if a cryptocurrency released by the government could exceed bitcoin[151], which, at the moment, confirms its first place in the market. It is almost two years since some Chinese press spread the news[152] that the

[150] Alex Paley, *Navigating Crypto Regulation: China*, available at https://hackernoon.com/navigating-crypto-regulation-china-fbae88697a21
[151] CCN, *China's Central Bank Completes Digital Currency Trial on a Blockchain*, January 30, 2017, available at https://www.ccn.com/chinas-central-bank-completes-digital-currency-trial-blockchain/
[152] Zhao Jin, *Is China going to launch its own cryptocurrency?*, available at https://www.quora.com/Is-China-going-to-launch-its-own-cryptocurrency

Government is working to release its own crypto or- better- digitize the Yuan. [153]This was stated by Hua Zhang, co-founder of DAEX Blockchain Group Limited, a company that has recently been working in the cryptocurrency ecosystem. To make the cryptocurrency work, it needs the balance between the decentralized nature of the blockchain and the centralized nature of the clearing system and, above all, it is necessary a guaranteeing structure that can control the digital resources, which are not yet present. The most obvious reason is that Chinese government (and all countries institution in general) is waiting for the system to mature in order to regulate it and then release a possible *Cryptoyuan*.[154] If the government makes its cryptocurrency official, there could be financial, economic, social and environmental impacts. Although it is difficult to make predictions, we will try to identify possible ones.[155]

-Financial impact.

Seeing it in a positive light, it is certainly the rise of a financial crisis with enormous impacts on the Forex market. In fact, if the new Chinese crypto were made available on the market, it could challenge the supremacy of the dollar, overturning foreign relations. In addition, it could improve financial services in terms of performance and speed.

-Economic impacts.

It could bring fundamental change in the structure of the Chinese economic model. For these reasons the government needs times (not less than a decade) to be well prepared to this huge Venture Capital investments changeset in Crypto-related startups which will increase as well as Crypto ATM and the number of services providers (crypto exchange, Wallet Services, Hedge Funds, etc.).

-Social impacts.

We can have two huge impacts. The first could be that the birth of a *cryptoyuan* would lead China to a more digitalized economy. The second effect is that the new crypto could

[153] IG Analyst, *What if China releases a government-backed cryptocurrency*?, July 17, 2018, available at https://www.ig.com/au/trading-opportunities/what-if-china-releases-a-government-backed-cryptocurrency--180717

[154] Sputniknews, *China Will Let Solely Cryptoyuan Into Country – Blockchain Comp*. Co-Founder, April 22, 2018, available at https://sputniknews.com/business/201804221063799132-china-cryptocurrencies-cryptoyuan-blockchain/

[155] Thomas Hale, Shaun Murison, Stephan Tual, *China's Government-Backed Cryptocurrency Overtakes Bitcoin,* available at https://www.ig.com/uk/forex/research/what-if/chinas-cryptocurrency-overtakes-bitcoin

integrate that portion of the population in China that lives in the countryside[156] who have no access to bank credit. For example, the case of Kenya testifies that the State, with appropriate regulations, is able to take advantage of the digital currency by giving more guarantees to users who can not have access to financial institutions. In fact, in 2007, after the parliamentary elections and serious incidents of violence, Kenya's banking system started collapsing, and the result was the introduction of M-Pesa, M-Pesa (M stands for Money and Pesa in Swahili means money) which is a currency directly transferred from one smartphone to another. Today M-Pesa manages half of Kenya's GDP.The success of the currency is due to the fact that users can use smartphone directly to transfer money. In fact, today people are more likely to own a mobile phone than a bank account, and M-Pesa gives financial control to its users. This method of transferring money has reduced the risk of theft and corruption (money flows are traceable) and has given everyone the opportunity, given the absence of tariffs in the exchange of money, to feel more secure in sending money.

-Environmental impact

Unfortunately, crypto technology is not environmentally friendly at all. [157] Energy expenditure is important both for mining and making the system non-hackerable. Potentially Bitcoin could become more efficient if multiple transactions within a single mining operation were made. However, if the spread and the value of Bitcoin really increases, the energy consumption will do the same. In China, considering that it has the lowest cost of electricity in the world, the scale of operations should travel at 6 PH (hash billions) per second, and in order to do this, it would need 3.3 % of the total energy of the Bitcoin network. Since this network is set to coin around 3,600 BTC a day, this mine would accumulate around 2,500 BTCs daily, which is currently equivalent to $ 6,400 US dollars.[158]

[156] Ethan Wilkes, *For China's Rural Poor , Life Without Banks,* March 28, 2013, available at https://www.theatlantic.com/china/archive/2013/03/for-chinas-rural-poor-life-without-banks/274435/
[157] Giulio Prisco, *Is Bitcoin Unsustainable, and How Can It Be Made Sustainable*, August 7, 2015, available https://bitcoinmagazine.com/articles/bitcoin-unsustainable-can-made-sustainable-1436386739/
[158] Aljazeera, *Inside the world of Chinese bitcoin mining*, January 17, 2018, available at https://www.aljazeera.com/indepth/inpictures/world-chinese-bitcoin-mining-180116112117869.html

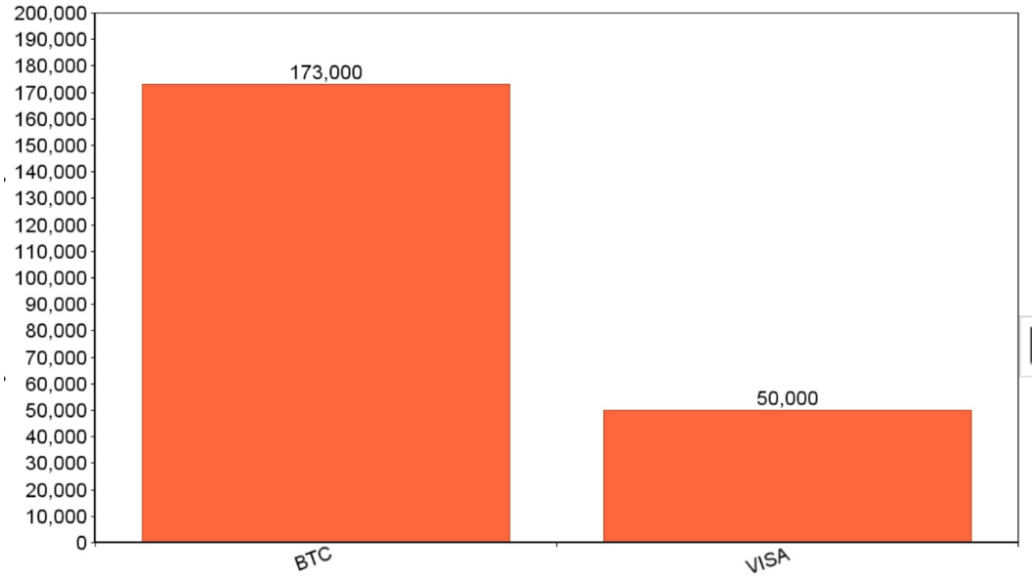

Fig. 33

Bitcoin Network vs. VISA network total consumption.[159]

According to the economist Teunis Brosens of Dutch bank ING, Bitcoin's global mining consumes a minimum of 200 KWh of energy per transaction. It is enough to feed his home in Holland for two weeks. [160]As climate change becomes an increasingly urgent issue for humanity every day, it is difficult to justify such a high level of energy consumption for a currency that wants to improve the world. There seem to be significant challenges underway to ensure that Bitcoin growth reduces its environmental impact, as stated by Jeremy McDaniels, an expert in the sustainability of financial systems at UNEP. "It is now clear to everyone that energy impact is a matter of primary importance". So there is hope that Bitcoin will be able to reduce its impact on the environment.

3.2.3 What if the Chinese Government centralizes Blockchain?

On March 2018, Zhang Ye, director of the China Securities Regulatory Commission (CSRC), on the occasion of the "Two Sessions" conference in Beijing, declared that Blockchain would be more effective if it was built on a centralized system. In fact, according to Zhang, from a technical point of view “the absolute decentralization of the blockchain is not valid because the blockchain itself is software and the software must be centralized. Understanding how

[159] Available at https://motherboard.vice.com/it/article/jpjnad/i-bitcoin-non-sono-sostenibili
[160] ING, *Why Bitcoin transaction are more expensive than you think*, October 13, 2017

to build a decentralized system based on a centralized structure requires further study."[161] In other words, the scalability and the needs for improving the governance mechanism and data privacy are the main problems for the Chinese Authorities and a Chinese cryptocurrency would be possible only if built and managed by Chinese central systems.

Actually, this position is not surprising at all. In the Communist China or in the former Soviet Union countries in general, it is typical to have this authoritarian and centralized attitude: the government must have the total control of institutions. This idea of politics became even more evident in the XIX National Congress of the Chinese party in October 2017. According to President Xi Jinping, centralization of decisions and extreme personalization, not only in politics but also in economic policy, are functional to maintaining a strong control of all the structures of the Chinese economy.[162]

According to the party ideologies, if China wanted to centralize a currency based on Blockchain technology, what should be pursued is the convenience and the speed of transactions. Furthermore, the Government must also work on the privacy of the coin and how to give more protection to investors. At the same time, it must be paid attention to financial stability, preventing financial risks and securing the monetary policy mechanism.

The final decision by the Chinese Authorities will depend on the maturity of the technology and the results of the tests that the government will carry out in the next months. The process will require an in-depth research and argumentation before a centralized monetary system will be introduced into the country.

[161] Wolfie Zhao, *Blockchain Needs Centralization, saiy Chinese SEC Officials,* March 6, 2018, available at https://www.coindesk.com/blockchain-needs-some-centralization-says-chinese-sec-official/

[162] Alessia Amighini, *Economia cinese: Il senso di Xi per il mercato*, October 18, 2017, available at https://www.ispionline.it/it/pubblicazione/economia-cinese-il-senso-di-xi-il-mercato-18130

Conclusions

The conclusions of this dissertation will focus on two fundamental questions:

1) Does prohibitionism really work in China?

2) If the Chinese Government wanted to build the Blockchain on a centralized system, assuming the full control of the system, could that not imply that the potential of the technology will be annihilated?

-Through this study it emerged that despite the two bans from the Chinese authorities, first on the trading of the cryptocurrencies and then on the ICO, the cryptographic system in China continues to grow, putting itself as a world superpower for mining and the crypto market. At this point, a question arises spontaneously: are Chinese prohibitionist policies effective after all? In fact, we could give many examples of systems and ecologies that continued to proliferate in China even after prohibitionist policies and censorship were put in place. A striking example is the Chinese "big firewall" which prevents malicious information or access to American social applications such as Google, Facebook, Instagram, etc. from entering the country, according to the Chinese Communist Party's policy. At the end of 2017, 772 million people had access to the internet. Many of these today use Virtual Private Network (VPN) to bypass the network and gain access to foreign websites. And the same thing is occurring with the cryptocurrency and ICOs. Users use loopholes to participate in crowdfunding projects or invest their own cryptocurrencies. Information, like people, can not be retained forever and China would seem to be reinforcing this vast system of censorship by making public its vision of internet sovereignty as a world model. This seems to be a move to eliminate access to the outside world and create a sort of Chinese intranet, but in reality, it seems to be an attempt to extend legal control and oversight over what is published online within the country. One thing is certain: if China has adopted the "Blockchain before bitcoin" policy, banning cryptocurrencies and investing in the underlying technology, it is because the government has been struck by the power and the importance of this technology. By 2019 we will see in which direction the Government will decide to move: if it will continue with the crypto ban policy or if it will decide to lift the ban and issue a more extensive and accurate set of regulations for the trading crypto market.

- According to the Chinese Government, the major problems related to the Blockchain would be the scalability and the needs for improving the governance mechanism and data privacy. But if the Blockchain were centralized and under the control of the government, many problems could be solved. If, however, the Government built the Blockchain on a centralized

system, assuming the full control of it, would the potential of the technology not be annihilated?

What we learnt from the web is that innovative technologies are often built by open protocols, thanks to which everyone can contribute in size and influence. For example, at the beginning, Google, the most important search engine in the world, did not try to control the web but gave it a precise order. The potential of the blockchain for banks and other related application fields are yet to be explored, but its core functions are clear. The Blockchain and the crypto-market ecosystem still present a number of problems such as the lack of legislative supervision at a global scale, the lack of integration with existing IT systems, privacy control, and many other issues. At the same time these problems could be solved, should experts and organizations worldwide concentrate their efforts on the implementation of effective and technology-enabling regulations and on the overcoming of the technological flaws that blockchain technology already showed under certain situations. For the first time, technology may not be kept in check by centralized entities thanks to Blockchain's decentralized structure and in accordance with the vision of the "libertarian dream" of Satoshi and its founders.

Glossary of Chinese terms

Chinese Characters	Pīnyīn	English
山寨币	Shānzhài bì	Altcoin
匿名	nìmíng	Anonimity
比特币	bǐtè bì	Bitcoin
区块链	qū kuài liàn	Blockchain
虚拟货币	xūnǐ huòbì	Cryptocurrency
以太坊	yǐtài fāng	Ethereum
行业组织	hángyè zǔzhī	Financial Industry Organizations
首次代币发行	shǒucì dài bì fāxíng	Initial Coin Offering
投资风险	tóuzī fēngxiǎn	Investment risk
货币当局	huòbì dāngjú	Monetary Authority
金额	jīn'é	Monetary value
洗钱	xǐqián	Money Laundering
通知	tōngzhī	Notice
中国人民银行	zhōngguó rénmíng yínháng	People’s Bank of China
财产权益	cáichǎn quányì	Property Right
社会公众	shèhuì gōngzhòng	Public society
人民币	rénmínbì	Renminbi
报告	Bàogào	Report

智能合约	zhìnéng héyuē	Smart Contract
智能经济	zhìnéng jīngjì	Smart Economy
代币发行融资活动	dài bì fāxíng róngzī huódòng	Token Fundraising Activities
虚拟商品	xūnǐ shāngpǐn	Virtual commodity
虚拟货币交易	xūnǐ huòbì jiāoyì	Virtual Currency transactions

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中国人民银行等五部委发布《关于防范比特币风险的通知》

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为保护社会公众的财产权益，保障人民币的法定货币地位，防范洗钱风险，维护金融稳定，中国人民银行、工业和信息化部、中国银行业监督管理委员会、中国证券监督管理委员会、中国保险监督管理委员会日前联合印发了《中国人民银行 工业和信息化部 中国银行业监督管理委员会 中国证券监督管理委员会 中国保险监督管理委员会关于防范比特币风险的通知》（银发〔2013〕289号，以下简称“《通知》”）。

《通知》明确了比特币的性质，认为比特币不是由货币当局发行，不具有法偿性与强制性等货币属性，并不是真正意义的货币。从性质上看，比特币是一种特定的虚拟商品，不具有与货币等同的法律地位，不能且不应作为货币在市场上流通使用。但是，比特币交易作为一种互联网上的商品买卖行为，普通民众在自担风险的前提下拥有参与的自由。

《通知》要求，现阶段，各金融机构和支付机构不得以比特币为产品或服务定价，不得买卖或作为中央对手买卖比特币，不得承保与比特币相关的保险业务或将比特币纳入保险责任范围，不得直接或间接为客户提供其他与比特币相关的服务，包括：为客户提供比特币登记、交易、清算、结算等服务；接受比特币或以比特币作为支付结算工具；开展比特币与人民币及外币的兑换服务；开展比特币的储存、托管、抵押等业务；发行与比特币相关的金融产品；将比特币作为信托、基金等投资的投资标的等。

《通知》规定，作为比特币主要交易平台的比特币互联网站，应当根据《中华人民共和国电信条例》和《互联网信息服务管理办法》的规定，依法在电信管理机构备案。同时，针对比特币具有较高的洗钱风险和被犯罪分子利用的风险，《通知》要求相关机构按照《中华人民共和国反洗钱法》的要求，切实履行客户身份识别、可疑交易报告等法定反洗钱义务，切实防范与比特币相关的洗钱风险。

为了避免因比特币等虚拟商品借“虚拟货币”之名过度炒作，损害公众利益和人民币的法定货币地位，《通知》要求金融机构、支付机构在日常工作中应当正确使用货币概念，注重加强对社会公众货币知识的教育，将正确认识货币、正确看待虚拟商品和虚拟货币、理性投资、合理控制投资风险、维护自身财产安全等观念纳入金融知识普及活动的内容，引导公众树立正确的货币观念和投资理念。

今后，人民银行将基于自身职责，继续密切关注比特币的动向和相关风险。

（完）

附件：

中国人民银行 工业和信息化部 中国银行业监督管理委员会
中国证券监督管理委员会 中国保险监督管理委员会
关于防范比特币风险的通知

近期，一种通过特定计算机程序计算出来的所谓“比特币”（Bitcoin）在国际上引起了广泛关注，国内也有一些机构和个人借机炒作比特币及与比特币相关的产品。为保护社会公众的财产权益，保障人民币的法定货币地位，防范洗钱风险，维护金融稳定，依据《中华人民共和国中国人民银行法》、《中华人民共和国反洗钱法》、《中华人民共和国商业银行法》、《中华人民共和国电信条例》等有关法律法规，现将有关事项通知如下：

一、正确认识比特币的属性

比特币具有没有集中发行方、总量有限、使用不受地域限制和匿名性等四个主要特点。虽然比特币被称为“货币”，但由于其不是由货币当局发行，不具有法偿性与强制性等货币属性，并不是真正意义的货币。从性质上看，比特币应当是一种特定的虚拟商品，不具有与货币等同的法律地位，不能且不应作为货币在市场上流通使用。

二、各金融机构和支付机构不得开展与比特币相关的业务

现阶段，各金融机构和支付机构不得以比特币为产品或服务定价，不得买卖或作为中央对手买卖比特币，不得承保与比特币相关的保险业务或将比特币纳入保险责任范围，不得直接或间接为客户提供其他与比特币相关的服务，包括：为客户提供比特币登记、交易、清算、结算等服务；接受比特币或以比特币作为支付结算工具；开展比特币与人民币及外币的兑换服务；开展比特币的储存、托管、抵押等业务；发行与比特币相关的金融产品；将比特币作为信托、基金等投资的投资标的等。

三、加强对比特币互联网站的管理

依据《中华人民共和国电信条例》和《互联网信息服务管理办法》，提供比特币登记、交易等服务的互联网站应当在电信管理机构备案。

电信管理机构根据相关管理部门的认定和处罚意见，依法对违法比特币互联网站予以关闭。

四、防范比特币可能产生的洗钱风险

中国人民银行各分支机构应当密切关注比特币及其他类似的具有匿名、跨境流通便利等特征的虚拟商品的动向及态势，认真研判洗钱风险，研究制定有针对性的防范措施。各分支机构应当将在辖区内依法设立并提供比特币登记、交易等服务的机构纳入反洗钱监管，督促其加强反洗钱监测。

提供比特币登记、交易等服务的互联网站应切实履行反洗钱义务，对用户身份进行识别，要求用户使用实名注册，登记姓名、身份证号码等信息。各金融机构、支付机构以及提供比特币登记、交易等服务的互联网站如发现与比特币及其他虚拟商品相关的可疑交易，应当立即向中国反洗钱监测分析中心报告，并配合中国人民银行的反洗钱调查活动；对于发现使用比特币进行诈骗、赌博、洗钱等犯罪活动线索的，应及时向公安机关报案。

五、加强对社会公众货币知识的教育及投资风险提示

各部门和金融机构、支付机构在日常工作中应当正确使用货币概念，注重加强对社会公众货币知识的教育，将正确认识货币、正确看待虚拟商品和虚拟货币、理性投资、合理控制投资风险、维护自身财产安全等观念纳入金融知识普及活动的内容，引导社会公众树立正确的货币观念和投资理念。

各金融监管机构可以根据本通知制定相关实施细则。

请中国人民银行上海总部，各分行、营业管理部、省会（首府）城市中心支行将本通知转发至辖区内各地方性金融机构和支付机构。本通知执行过程中发现的新情况、新问题，请及时向中国人民银行报告。

联系人：张念念，联系电话：010-66194489

中国人民银行

工业和信息化部

银　　监　　会

证　　监　　会

保　　监　　会

2013 年 12 月 3 日

中国人民银行 中央网信办 工业和信息化部 工商总局 银监会 证监会 保监会关于防范代币发行融资风险的公告

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近期，国内通过发行代币形式包括首次代币发行（ICO）进行融资的活动大量涌现，投机炒作盛行，涉嫌从事非法金融活动，严重扰乱了经济金融秩序。为贯彻落实全国金融工作会议精神，保护投资者合法权益，防范化解金融风险，依据《中华人民共和国人民银行法》、《中华人民共和国商业银行法》、《中华人民共和国证券法》、《中华人民共和国网络安全法》、《中华人民共和国电信条例》、《非法金融机构和非法金融业务活动取缔办法》等法律法规，现将有关事项公告如下：

一、准确认识代币发行融资活动的本质属性

代币发行融资是指融资主体通过代币的违规发售、流通，向投资者筹集比特币、以太币等所谓“虚拟货币”，本质上是一种未经批准非法公开融资的行为，涉嫌非法发售代币票券、非法发行证券以及非法集资、金融诈骗、传销等违法犯罪活动。有关部门将密切监测有关动态，加强与司法部门和地方政府的工作协同，按照现行工作机制，严格执法，坚决治理市场乱象。发现涉嫌犯罪问题，将移送司法机关。

代币发行融资中使用的代币或“虚拟货币”不由货币当局发行，不具有法偿性与强制性等货币属性，不具有与货币等同的法律地位，不能也不应作为货币在市场上流通使用。

二、任何组织和个人不得非法从事代币发行融资活动

本公告发布之日起，各类代币发行融资活动应当立即停止。已完成代币发行融资的组织和个人应当做出清退等安排，合理保护投资者权益，妥善处置风险。有关部门将依法严肃查处拒不停止的代币发行融资活动以及已完成的代币发行融资项目中的违法违规行为。

三、加强代币融资交易平台的管理

本公告发布之日起，任何所谓的代币融资交易平台不得从事法定货币与代币、“虚拟货币”相互之间的兑换业务，不得买卖或作为中央对手方买卖代币或“虚拟货币”，不得为代币或“虚拟货币”提供定价、信息中介等服务。

对于存在违法违规问题的代币融资交易平台，金融管理部门将提请电信主管部门依法关闭其网站平台及移动 APP，提请网信部门对移动 APP 在应用商店做下架处置，并提请工商管理部门依法吊销其营业执照。

四、各金融机构和非银行支付机构不得开展与代币发行融资交易相关的业务

各金融机构和非银行支付机构不得直接或间接为代币发行融资和“虚拟货币”提供账户开立、登记、交易、清算、结算等产品或服务，不得承保与代币和“虚拟货币”相关的保险业务或将代币和“虚拟货币”纳入保险责任范围。金融机构和非银行支付机构发现代币发行融资交易违法违规线索的，应当及时向有关部门报告。

五、社会公众应当高度警惕代币发行融资与交易的风险隐患

代币发行融资与交易存在多重风险，包括虚假资产风险、经营失败风险、投资炒作风险等，投资者须自行承担投资风险，希望广大投资者谨防上当受骗。

对各类使用“币”的名称开展的非法金融活动，社会公众应当强化风险防范意识和识别能力，及时举报相关违法违规线索。

六、充分发挥行业组织的自律作用

各类金融行业组织应当做好政策解读，督促会员单位自觉抵制与代币发行融资交易及“虚拟货币”相关的非法金融活动，远离市场乱象，加强投资者教育，共同维护正常的金融秩序。

Aknowledgments

I have just concluded my dissertation as a final step in my university studies, during which I have had the opportunity to meet a lot of people. Some of them have become very good friends always showing affection and giving me their precious support in spite of the distance.

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