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Crypto-assets and financial consumers: A review of surrounding legal issues

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ABSTRACT

Crypto-assets or cryptocurrencies have emerged globally lately. This paper aims to discuss several issues about crypto-assets or cryptocurrencies while it introduces the some Korean issues. Recent attempts to regulate crypto-assets or cryptocurrencies are mostly to avoid/decrease regulatory arbitrage. Activities surrounding crypto-assets or cryptocurrencies may constitute pseudo-deposit taking activities subject to the related banking regulations. As cryptocurrencies are sometimes traded like money, activities dealing with cryptocurrencies may be subject to regulations about anti-money laundering (AML) and counter terrorist financing (CTF). Securities issues to protect investors are most topical; securities issues makes ICOs reviewed from an investor protection aspect thereby justifying application of securities regulations. Furthermore, the issue of accounting and taxation, and privacy issue are also important which need to keep watching.

Keywords: crypto-asset, cryptocurrency, ICO, securities, accounting, pseudo-banking, anti-money laundering

I. Introduction

Nowadays we call Bitcoin and Ether as crypto-assets¹. Crypto-assets are digital assets recorded on a distributed ledger; their name is derived from the cryptographic security mechanisms used within public, permission-less distributed ledgers.² In many cases, they are said to challenge established beliefs about money, economic relationships and investing.³

When we look at a crypto-asset to find out its features, there are several features which make it distinguished from other virtual currencies: it is ① a digital asset designed to work as a medium of exchange using cryptography to secure integrity, ② a type of digital currencies, alternative currencies and virtual currencies, ③ decentralized currency as opposed to centralized electronic money and central banking systems, and ④ equipped with a mechanism working through a blockchain, that is, a public transaction database functioning as a distributed ledger.⁴

South Korea whose population is less than 50 million people is the third-biggest market in the world for Bitcoin trades, behind Japan and the US (a digital currency website Coinhills). As of January 2018, Korea had more than a dozen crypto-assets exchanges according to the estima-

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¹ Nowadays, the word of crypto-assets becomes more prevailing than cryptocurrencies, so we also call Bitcoin, et al. as crypto-asset except in some cases focused on a function of currency.

² Ernst & Young, "IFRS (#) Accounting for crypto-assets", (Aug. 2018), p.2, [https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/\\$File/EY-IFRS-Accounting-for-crypto-assets.pdf](https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf).

³ Ernst & Young, "IFRS (#) Accounting for crypto-assets", (Aug. 2018), p.2, [https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/\\$File/EY-IFRS-Accounting-for-crypto-assets.pdf](https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf).

⁴ Wikipedia, "cryptocurrency", <https://en.wikipedia.org/wiki/Cryptocurrency>.

⁴ Wikipedia, "cryptocurrency", <https://en.wikipedia.org/wiki/Cryptocurrency>.

tion by Korea Blockchain Industry Association and there's so much demand that the virtual currency has traded at as much as a 30% premium compared with other countries until last January.⁵

However, due to many bad social situations such as speculative activities, etc.⁶, the South Korea government even considered of shutting down its all crypto-asset trading platforms (so-called exchanges) to protect investors. But instead of shutting them down, the financial supervisory authority (FSC) of Korea banned initial coin offerings (ICOs) in September 2017 following China's lead. So ICOs are technically not allowed as the token-based funding method was banned.⁷ Moreover, Korea has implemented regulations aimed at banning anonymous crypto-asset exchange accounts thereby forcing a real-name account system on 30 January 2018. For the more, several bills have been proposed at the Korean national assembly to address legal/social issues related to crypto-asset passion.

II. Legal characteristics of crypto-assets

A. Crypto-assets and related issues to be addressed

What are crypto-assets? The following Figure 1 tries to classify what we call crypto-assets. Crypto-assets are digital representations of value, issued by private developers and denominated in their own unit of account and they fall within the broader category of digital currencies. Their schemes have different levels of convertibility to real-world goods, services, national currencies, or other crypto-assets.⁸ Decentralized VC schemes use techniques from cryptography for their operations.⁹

As mentioned already, crypto-assets are posing challenges to our established beliefs surrounding money, eco-

nomical relationships and investing, so topics of crypto-assets are brand new. But without appropriate regulation, crypto-assets will enjoy regulatory arbitrage which we usually need to address. Furthermore, so variety of diverse coins and tokens have been issued, which makes us impossible to approach/solve problems in a simple/unilateral way.

As distributed ledgers are located in computers around this world, there is incontestable limitation on control by a country; each nation cannot shut down the whole network or alter its technical rules. Even worse, countries have shown so variable attitudes on crypto-assets regulations¹⁰, so international cooperation seems more difficult.

B. Classification and purpose of use

There are diverse types of crypto-assets in the world. So one of the very potential and influential standards for classification may be based on the purposes of using crypto-assets. As seen in the following table, crypto-assets can be used for payment, investment (capital gain), a specific service, or for mixed purpose or other. It is not easy to classify what crypto-assets are in real cases.

C. Need for legitimization

As main features of most of crypto-assets, features are known such as irreversible transactions, lack of or inadequate understanding, experienced price volatility and following economic risk. Most crypto-assets have no valuation guarantee scheme except few cases like Petro in Venezuela or emCash in Dubai.¹¹

⁵ BBC, "Bitcoin: South Korea sways cryptocurrency prices - but how?", (17 Jan. 2018), <https://www.bbc.com/news/business-42713314>.

⁶ MBN, "From the tulip bubble to the bit coin, the history of madness", (1 Dec. 2017), <http://news.mk.co.kr/newsRead.php?year=2017&no=797703>.

⁷ Coindesk, "Korean Financial Watchdogs Probing Blockchain Firms Over ICO Activity", (Sep 12, 2018), <https://www.coindesk.com/korean-financial-watchdogs-probing-blockchain-firms-over-ico-activity/>.

⁸ IMF Staff Discussion Note, "Virtual Currencies and Beyond: Initial Considerations", SDN/16/03, (Jan. 2016), pp.7-8.

⁹ Ibid. p.9

¹⁰ Bloomberg, "What the World's Central Banks Are Saying About Bitcoin", (15 Dec. 2017), <https://www.bloomberg.com/news/articles/2017-12-15/what-the-world-s-central-banks-are-saying-about-cryptocurrencies>

¹¹ Petro is a crypto-asset of which underlying asset is oil produced in Venezuela. Petro began to be issued since February 2018 backed by the state (Venezuela). Seoul Daily, "Pepper, whiskey, oil coin ... cryptocurrencies linked with physical assets being issuing burst", (28 Mar. 2018), <http://decenter.sedaily.com/NewsView/1RX5N13AU7>; Dubai launched emCash in 2017 and emCash was developed as a digital-fi at equivalent of the United Arab Emirate dirham as the UAE State pushes official blockchain-based crypto-asset emCash. Coinspeaker, "UAE State Pushes Official Blockchain-based Cryptocurrency emCash for Wider Adoption", (Oct. 9th, 2018), <https://www.coinspeaker.com/2018/10/09/uae-state-pushes-official-blockchain-based-cryptocurrency-emcash-f-or-wider-adoption/>

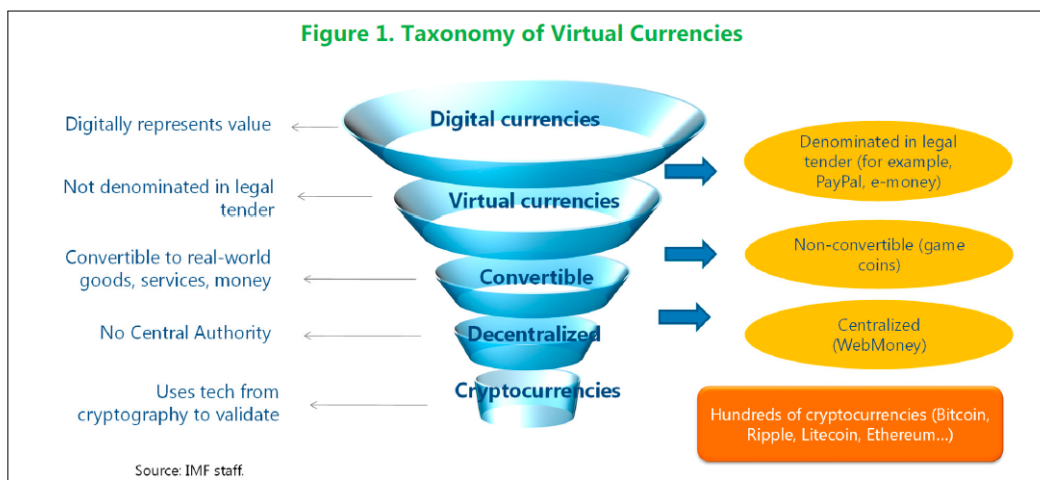


Figure 1. Taxonomy of virtual currencies

Source: IMF Staff Discussion Note, “Virtual Currencies and Beyond: Initial Considerations”, SDN/16/03, (Jan. 2016)

Potential classification	Related issue
Cash	Legal tender?
Cash equivalents	High volatility in its price?
Financial instruments	Any contractual right to counterparty?
Intangible assets	Suitable for making profits with it?
Inventories	The same as the other inventory goods?
Fair value measurement	Can the market price be accepted as objective and trustable?

Figure 2. Potential classification

Note: the English translations were added by the author.
Source: HangSang Lee, KAI Forum (22 Mar. 2018)

Pros: useful	Cons: bad
Easy for funding as it helps the issuer collect money globally. Need to make good regulations to keep good investors remain in the funding market	No underlying real value; solely based on Demand in the market <ul style="list-style-type: none"> • If there is no demand, there will be no value to crypto-assets holders. • Concern of Ponzi scheme
Helpful for a new business model where, without the intervention of venture capitals (middle man), consumers can invest to the business and share profits therefrom.	Not much useful for buying goods unlike the fiat money, stocks, etc. <ul style="list-style-type: none"> • No tangible assets • Difficult to calculate its value • Vulnerable to speculation • Speculative bubble [tulip]

Figure 3. Pros and cons of crypto-assets

ChosunBiz Daily, “[Virtual currency regulation] Economists vs IT experts ... clearly cut wires” (6. Dec. 2017), http://m.biz.chosun.com/svc/article.html?contid=2017120502948&related_m_all

III. Legal issues on crypto-assets

A. Overview

As crypto-assets are variable, they can be classified in diverse categories.

For crypto-assets related issues, firstly we can name banking business issues of countering pseudo-deposit taking activities and deposit insurance, capital adequacy test, etc. Secondly, there are payment/settlement issues on enhancing efficiency and ensuring integrity (cyber risk). Thirdly, anti-money laundering (AML) and counter terrorist financing (CTF) issues forces Know Your Customer (KYC) rule. Fourthly, securities issues for investor protection need to establish related regulation, authority, etc. Securities issues make initial coin/token offering (ICO/ITO) in a consumer protection point of view, and regulating transaction platforms. Fifthly, there is an issue of accounting and taxation. Furthermore, there are also a privacy issue and an issue of central bank cryptocurrencies (CBCC) and related financial instability issue.

This article lightly introduces and deals with these crypto-asset related issues except the issues of payment/settlement and CBCC; payment/settlement issues are rather technical matters and CBCC issue is so controversial.

B. Banking business issue

1. Countering pseudo-deposit taking activities

When it comes to the banking business issue, regulatory

arbitrage matters. If a coin/token can be cash or a cash equivalent for payment, the issuer might have to be regulated as a deposit institution. And the issuing activity may be subject to the Banking Act which demands banking licence, deposit insurance, regulatory capital ratio under the BIS regime, etc. Although this issue is controversial, there is reportedly no country which has begun to apply actively banking regulations to cryptocurrencies. However, this might matter if cryptocurrencies prevail so much in the future as to encroach on the legal tender area.

Under the current Banking Act in Korea, any person who intends to engage in banking business shall obtain authorization in advance from the relevant authority (the Financial Services Commission) (Art. 8 para.1). The term "banking business" means a business of lending funds raised by bearing debts owed to many and unspecified persons, by the receipt of deposits or the issuance of securities and other bonds (Art. 2 para.1). Therefore, if a person manages a business raising cryptocurrencies by act of receiving deposits of cryptocurrencies and lending those to many and unspecified persons, he/she might be doing a banking business using cryptocurrencies.

The current Banking Act stipulates strict requirements for acquiring a banking business license such as capital of at least 100 billion won, an appropriate plan for raising funds, sufficient investment capabilities for large shareholders, a feasible and sound business plan, a plan for stockholder composition in compliance with this Act, sufficient capabilities (human resources, business facilities, computer systems and other physical facilities), individual incorporators and executive officers' requirements under the Act on Corporate Governance of Financial Companies, etc.

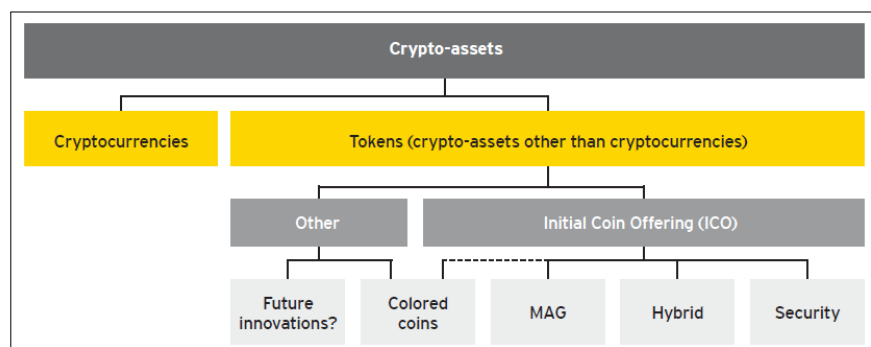


Figure 4. Classification of crypto-assets

Ernst & Young, "IFRS (#) Accounting for crypto-assets", (2018), p.3, [https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/\\$File/EY-IFRS-Accounting-for-crypto-assets.pdf](https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf).

2. Deposit insurance, capital adequacy test, etc.

In Korea, the Depositor Protection Act aims to protect depositors, etc. and maintain the stability of the financial system by efficiently operating the deposit insurance system, etc. (Art. 1). Accordingly, it provides that banks authorized under the Banking Act are also imposed on duties by the Depositor Protection Act so bank must pay the insurance premium in the capacity of an insured financial company (Art. 2 and Art. 30).

In addition, banks should abide by regulations of regulatory capital ratio or capital adequacy ratio; regulatory capital ratio is a bank's capital reserved against its risk. To ensure a bank can absorb a reasonable amount of loss and complies, The Detailed regulation on Banking Business announced by the Governor of the Financial Supervisory Service forces the regulatory capital ratio as statutory capital requirements (Art. 17). Therefore, if a cryptocurrency could be classified as a *currency*, it might become subject to the regulations under these Korean Deposit Protection Act and Banking Act. As for now, there remains legal uncertainty as there is no statutory definition under Korean laws although related bills are being discussed in the Korean parliament.

C. AML/CTF issue

Currently in Korea, no cryptocurrency is the legal tender recognized under Bank of Korea Act. Neither are they regulated digital currency of the Electronic Financial Transactions Act in Korea as they lack of exchangeability with fiat currency under this Act. Furthermore, cryptocurrencies are not subject to the Electronic Financial Transactions Act as they cannot be "electronic currency" of this Act. Electronic currency, issued with transferable monetary values stored by electronic means, must be issued in exchange for the same value of cash or deposits and must be exchangeable for cash or deposits under guarantee of the issuer (Art. 2 para.15). As such, Korean AML/CTF requirements are hard to be applied to cryptocurrencies under the existing Korean legal framework.

However, to cope with the *practical* money laundering problem, the Korea Financial Intelligence Unit (KoFIU) announced AML Guideline after it co-worked with the Korean financial supervisory authorities (the FSC, the FSS) and the AML Guideline was enforced on 30 January

2018. This AML Guideline provides Banks' heightened duty of care in relation to Know Your Customer (KYC) rule. As heightened duty of care, banks should care enough to identify whether their financial transaction counterparties are cryptocurrencies trading platform. Secondly, banks are imposed on heightened duty of care in relation to KYC; if a bank's transaction counterparty is identified as cryptocurrency trading platform, banks have an Enhanced Due Diligence (EDD) on KYC. Therefore, banks should check additional information such as a platform's goal of financial transaction and its money source: what services provided by the platform: whether the platform provides real name verification deposit account service and it checks the identity of its platform users: whether the platform manages separately its own asset and its users' trusted money (ring-fencing funds), etc. If the platform does not check the real-names of trading account holders or it refuses to offer information to the banks, banks should deny transaction with it. Moreover, if there is a reasonable doubt of AML, banks have duties to report to KoFIU when a financial transaction related to cryptocurrencies is doubted as ML one.¹²

Other countries are preparing or have prepared to address AML issue. For instance, the Monetary Authority of Singapore (MAS) announced the Payment Services Bill as its proposed payments regulatory framework in 2017. This bill will empower the MAS to regulate payment services with a view to anti-money laundering and terrorism financing.¹³ Korean parliament is also preparing to make appropriate law which can deal with cryptocurrency AML issue.

D. Securities issue

Securities issue is definitely most topical and con-

¹² KoFIU suggests several transaction types doubted as money laundering in relation to cryptocurrency trading such as ① large amount of transaction with a platform (\$10,000/day, \$20,000/week), ② frequent transactions during a short period (such as 5 times/day, 7 times/week), ③ platforms'f continuous remittance to people presumed as their executives and staffs. FSC, "Virtual Money Anti-Money Laundering Guidelines", FSC release (2018.1.28.), <http://www.fsc.go.kr>

¹³ MAS, "MAS Launches Second Consultation on New Regulatory Framework for Payments", (21 Nov. 2017), <http://www.mas.gov.sg/News-and-Publications/Media-Releases/2017/MAS-Launches-Second-Consultation-on-New-Regulatory-Framework-for-Payments.aspx>; as of September 2018, this bill still remains as a bill.

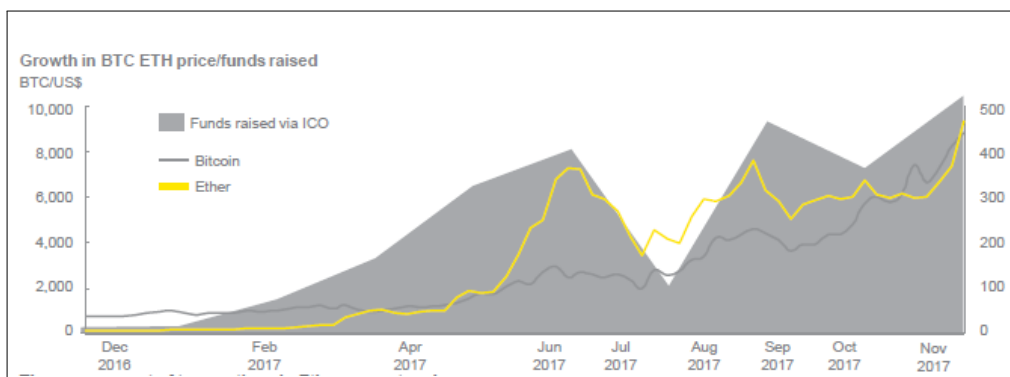


Figure 5. Token valuation ICOs fuel demand for Ether and bitcoin (BTC)

Ernst & Young, "EY research: initial coin offerings (ICOs)", (17 Dec 2017), p.27, <https://bravenewcoin.com/insights/ey-research-initial-coin-offerings-icos->.

controversial one among legal issues on crypto-assets. These days lots of fund are being raised by ICOs substituting for IPOs. Fund raised by ICOs are mostly cryptocurrencies such as Bitcoin or Ether, not the legal tenders.

Securities issue begins from the feature of programmable cryptocurrencies like Ethereum. Unlike Bitcoin, Ethereum is not just a blockchain; it is a rather blockchain-based software platform. Ethereum allows users to build and execute smart contracts and Distributed Autonomous Applications (DApps).¹⁴ After that, its cryptocurrency asset (Ether) helps in executing these apps and contracts.

Various tokens can be issued in return for Ether in each project which is automatically executable through smart contracts in DApps. Those tokens can constitute securities under securities regulations if they are sold to investors for expectation of future profit. Having said that, now some countries like Singapore, Switzerland and the US have developed or are developing securities regulations on cryptocurrencies to protect investors. This approach focuses especially on regulation of ICOs.

On the other hand, Korea has not yet discussed this issue enough but its financial supervisory authorities are now showing signs of changes surrounding regulation of crypto-assets. Recently Korean authorities contacted domestic blockchain startups as part of an investigation

into ICOs¹⁵ although there is no announcement of applying securities regulations on crypto-assets so far.

The SEC, US securities regulator has not only to agreed that crypto-assets can be securities under related laws but it also announced in March this year that trading platforms for crypto-assets are required to be registered as an exchange. US related federal laws require a trading platform to be registered with the SEC as a national securities exchange or must be exempt from registration, if it offers trading of digital assets that are securities and operates as an "exchange", as defined by the federal securities laws.¹⁶

For another example, Singapore, one of the countries where ICOs are being actively done, published a guide to digital token offerings' in November 2017. This guide says that Singapore supervisor, the MAS will examine the structure and characteristics of, including the rights attached to, a digital token. If the MAS decides that a digital token is capital markets products, offerors of that digital token should register with the MAS subject to the Securities and Futures Act. In this context, exchanges must consult the MAS before trading in digital tokens that are deemed to be securities or futures contracts.¹⁷

¹⁴ The inbuilt programming language Solidity is used to write smart contracts and DApps. Quora.com, "How is the Ethereum blockchain different from the Bitcoin blockchain?", (Feb. 7, 2018), <https://www.quora.com/How-is-the-Ethereum-blockchain-different-from-the-Bitcoin-blockchain>

¹⁵ Coindesk, "Korean Financial Watchdogs Probing Blockchain Firms Over ICO Activity", (Sep 12, 2018), <https://www.coindesk.com/korean-financial-watchdogs-probing-blockchain-firms-over-ico-activity/>

¹⁶ SEC, "Initial Coin Offerings (ICOs)", <https://www.sec.gov/ICO>

¹⁷ Straitstimes, "MAS turns up heat on cryptocurrency exchanges, ICOs", (May 25, 2018), <https://www.straitstimes.com/business/banking/mas-turns-up-heat-on-cryptocurrency-exchanges-icos>

E. Accounting and Taxation

Taxation closely depends on the characteristics of the taxation objects and usually taxation is related with accounting. Accounting treatments of crypto-assets will depend on the particular facts and circumstances.¹⁸ Depending upon the features of crypto-assets and the people's purposes for holding them, crypto-assets can be classified as cash and cash equivalents, financial instruments (securities or derivatives), inventories, prepayment assets, or an intangible asset.¹⁹ However, as of the 2018 summer, the International Accounting Standards Board (IASB) has not yet decided about the topic of digital currencies accounting although it continuously searches how existing IFRS requirements may apply in accounting for ICOs and tokens held.²⁰ Currently the Korean government is working on these accounting and taxation matters.

F. Privacy issue

The belief that all transactions on a blockchain are anonymous is a prevalent misconception. In fact, transactions on public, permission-less blockchains such as the Bitcoin blockchain are pseudonymous; anyone can view the ledger where ownership of Bitcoin and all transactions that have occurred upon it are recorded. As these information exist as pseudonymous, one could track activity to particular addresses with enough data thereby addressing to individuals or parties involved in that blockchain.²¹

Therefore, there is a legal risk because personal subjects in blocks might be identifiable²². Personal data pseudony-

mised in blocks can be subject to the related law such as the EU General Data Protection Regulation (GDPR).

IV. Summary and Concluding Remarks

So far this paper introduced and discussed several issues about crypto-assets or cryptocurrencies.²³ If activities taking cryptocurrencies and lending them can constitute pseudo-deposit taking activities, those activities may be subject to the related banking laws which requires strict regulations like capital adequacy test and deposit insurance, etc. Although cryptocurrencies are not legal tenders, they are sometimes playing similar roles as that of money. Therefore, activities dealing with cryptocurrencies can be misused to evade anti-money laundering (AML) and counter terrorist financing (CTF). Currently, some nations including Korea have already implemented related regulations as Know Your Customer (KYC) rule.

Among others, securities issues to protect investors are most topical and strongest regulations. Securities issues makes ICOs reviewed from an investor protection aspect which forces appropriate securities regulations to avoid regulatory arbitrage. Among issues to be being discussed there is the issue of accounting and taxation, and privacy issue which we need to keep watching. Crypto-assets or cryptocurrencies related issues are developing very fast. This paper intends to cover current major legal issues briefly thereby helping to improve our understanding.

Some issues this paper has not dealt with, though important, are payment/settlement issues; these issues are mostly focused on enhancing efficiency and ensuring integrity. In addition, the issue of central bank cryptocurrencies (CBCC) and related financial instability issue remain untouched by this paper which need to be addressed alter. Most of all, various types of crypto-assets or cryptocurrencies are being created, so legal studies will con-

¹⁸ Ernst & Young, "Applying IFRS: Accounting by holders of crypto-assets", (Aug. 2018), p.2, <https://bravenewcoin.com/insights/applying-ifrs-accounting-by-holders-of-crypto-assets>; Cryptocurrencies or crypto-assets have diverse terms and conditions and people's purposes for holding them differ among the entities and sometimes even differ within the same entities that hold them. Ibid.

¹⁹ For detailed information, Ernst & Young, "Applying IFRS: Accounting by holders of crypto-assets", (Aug. 2018), p.6.

²⁰ IFRS Foundation website, IASB Update (July 2018), www.ifrs.org/news-and-events/updates/iasb-updates/july-2018 [recited from Ernst & Young, "Applying IFRS: Accounting by holders of crypto-assets", (Aug. 2018), p.23]

²¹ Ernst & Young, "IFRS (#) Accounting for crypto-assets", (2018), p.16. [https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/\\$File/EY-IFRS-Accounting-for-crypto-assets.pdf](https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf)

²² Mauro Conti, et al. survey the security and privacy aspects of Bitcoin and review the existing vulnerabilities in Bitcoin based on its major underlying technologies of blockchain and PoW-based consensus

protocol. Conti, et al. say that Bitcoin's vulnerabilities may lead to various security threats and that the anonymity considerations in Bitcoin are wrong with the privacy-related threats to Bitcoin users. Mauro Conti, et al., "A Survey on Security and Privacy Issues of Bitcoin", Submitted on 3 Jun 2017, last revised 25 Dec 2017, <https://arxiv.org/abs/1706.00916>.

²³ However, the issue of central banks cryptocurrencies (CBCC) remains not dealt with here although it should be addressed as an important issue in the aspect of financial instability.

tinuously have to be adjusted for new changes.

References

- BBC, "Bitcoin: South Korea sways cryptocurrency prices - but how?", (17 Jan. 2018), <https://www.bbc.com/news/business-42713314>.
- Bloomberg, "What the World's Central Banks Are Saying About Bitcoin", (15 Dec. 2017), <https://www.bloomberg.com/news/articles/2017-12-15/what-the-world-s-central-banks-are-saying-about-cryptocurrencies>
- ChosunBiz Daily, "[Virtual currency regulation] Economists vs IT experts ... clearly cut wires" (6. Dec. 2017), http://m.biz.chosun.com/svc/article.html?contid=2017120502948&related_m_all
- Coindesk, "Korean Financial Watchdogs Probing Blockchain Firms Over ICO Activity", (Sep 12, 2018), <https://www.coindesk.com/korean-financial-watchdogs-probing-blockchain-firms-over-ico-activity/>.
- Coinspeaker, "UAE State Pushes Official Blockchain-based Cryptocurrency emCash for Wider Adoption", (Oct. 9th, 2018), <https://www.coinspeaker.com/2018/10/09/uae-state-pushes-official-blockchain-based-cryptocurrency-emcash-for-wider-adoption/>
- Conti, M., et al., "A Survey on Security and Privacy Issues of Bitcoin", Submitted on 3 Jun 2017, last revised 25 Dec 2017, <https://arxiv.org/abs/1706.00916>
- Ernst & Young, "IFRS (#) Accounting for crypto-assets", (Aug. 2018), [https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/\\$File/EY-IFRS-Accounting-for-crypto-assets.pdf](https://www.ey.com/Publication/vwLUAssets/EY-IFRS-Accounting-for-crypto-assets/$File/EY-IFRS-Accounting-for-crypto-assets.pdf)
- Ernst & Young, "Applying IFRS: Accounting by holders of crypto-assets", (Aug 2018), <https://bravenewcoin.com/insights/applying-ifrs-accounting-by-holders-of-crypto-assets>
- Ernst & Young, "EY research: initial coin offerings (ICOs)", (17 Dec 2017), <https://bravenewcoin.com/insights/ey-research-initial-coin-offerings-icos->
- FINMA, "ICO Guidelines for enquiries regarding the regulatory framework for initial coin offerings (ICOs)", (Feb. 2018), <https://www.finma.ch/en/news/2018/02/20180216-mm-ico-wegleitung/>
- FSC, "Virtual Money Anti-Money Laundering Guidelines", Korean FSC release (2018.1.28.), <http://www.fsc.go.kr>
- IMF Staff Discussion Note, "Virtual Currencies and Beyond: Initial Considerations", SDN/16/03, (Jan. 2016), <https://www.imf.org/external/pubs/ft/sdn/2016/sdn1603.pdf>
- MAS, "A Guide to Digital Token Offerings", (14 Nov 2017), <http://www.mas.gov.sg/News-and-Publications/Monographs-and-Information-Papers/2017/Guidance-on-Digital-Token-Offerings.aspx>
- MAS, "MAS Launches Second Consultation on New Regulatory Framework for Payments", (21 Nov. 2017), <http://www.mas.gov.sg/News-and-Publications/Media-Releases/2017/MAS-Launches-Second-Consultation-on-New-Regulatory-Framework-for-Payments.aspx>
- MBN, "From the tulip bubble to the bit coin, the history of madness", (1 Dec. 2017), <http://news.mk.co.kr/newsRead.php?year=2017&no=797703>.
- Quora.com, "How is the Ethereum blockchain different from the Bitcoin blockchain?", (Feb. 7, 2018), <https://www.quora.com/How-is-the-Ethereum-blockchain-different-from-the-Bitcoin-blockchain>
- SEC, "Initial Coin Offerings (ICOs)", <https://www.sec.gov/ICO>
- Seoul Daily, "Pepper, whiskey, oil coin ... cryptocurrencies linked with physical assets being issuing burst", (28 Mar. 2018), <http://decenter.sedaily.com/NewsView/1RX5N13AU7>
- Soulforged, "Universal Settlement Coin", Bitcoin Forum (Feb. 14, 2018). <https://bitcointalk.org/index.php?topic=2947517.msg30277908#msg30277908>
- Straitstimes, "MAS turns up heat on cryptocurrency exchanges, ICOs", (May 25, 2018), <https://www.straitstimes.com/business/banking/mas-turns-up-heat-on-cryptocurrency-exchanges-icos>
- Wikipedia, "cryptocurrency", <https://en.wikipedia.org/wiki/Cryptocurrency>

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